THE EUROPEAN UNION'S SINGLE MARKET INITIATIVE:

A NEW CONTEXT FOR CONSTRUCTION

by

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ABSTRACT

The opening of the European Union's Single Market on January 1, 1993 symbolically marks the beginning of a new era for business in Europe. The "diversity" of the European market is well known throughout the world, not only for its array of economic sectors but - perhaps even more so - for the extremely complex systems of regulations and controls embedded within and entrenched around each nation's market. Through the Single Market, those countries comprising the Union seek to remove existing barriers between individual markets, permitting the uninhibited flow of goods, services, capital and labor.

The driving force enabling this new market to take shape is policy and legislation devised at the Union level and implemented at the member state level. As a result, the competitive playing field within many industries is changing, albeit differently depending on the industry.

The thesis explores current and pending Union level actions which impact the construction industry. After briefly reviewing what the European Union is, specific initiatives taken at both the Union and national levels which serve to unify its infrastructures - in particular transportation - and resolve environmental concerns are discussed. The manner in which initiatives serving to effect market harmonization impact the construction industry - both the products and the processes of construction - is then addressed. The current and potential impact on the construction industry of Europe's two primary research and development initiatives - Framework and EUREKA - are then explored, followed by a brief discussion of the body which represents the interests of the construction industry at the Union level, the European Construction Industry Federation. The closing chapter provides conclusions drawn from the comments and observations of individuals within European construction businesses whose primary market focus is Europe. The manner in which the industry is being impacted - or not impacted - by the Single Market is addressed in detail.

Thesis Supervisor: Professor Fred Moavenzadeh, Director, Henry L. Pierce Laboratory

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1.0 The European Union[1] and The European Economic Area

The eyes of many diverse sectors within the international community have been observing the European Union (EU) and its actions with increased focus during the last decade of the twentieth century. As well they should, for what occurs within the EU and its twelve members states tends to carry profound implications within other areas of the world, geographic as well as political and economic.

The EU by any standard of measure is clearly an influential force within the world, as it comprises twelve nations with a total population of 346.3 million people and nets a gross domestic product (GDP) of $6,251.7 billion. This differs slightly from corresponding figures for the U.S., with a population of 252.7 million people and a GDP of $5677.5 billion. When viewed in terms of productivity per capita, the U.S. exceeds the EU by 24.5%.

	Population (millions)	GDP (current $ bn)	Per Capita ($)	Exports (% of GDP)	Imports (% of GDP)
US	252.7	5,677.5	22,467	7.5	8.8
EU-12	346.3	6,251.7	18,053	21.9	23.4

Table 1. A Comparison Between the U.S. and EU, Population and GDP (1991)[2]

A primary focus of the EU has been the Single Market initiative,[3] a wide variety of policies and agreements whose purpose is to not only increase the economic unity between European nations, but to increase the competitiveness of European industries within international market places. To assist in the reduction of barriers between EU member

[1]Referred to in the past as the European Community or EC.
[2]Source 16.
[3]Also commonly referred to as either the Single European Market, the Single Internal Market or the Single Market.

states and in the opening of intra-EU markets, the initiative's designers and implementers have devoted much attention to what are commonly referred to as the four freedoms of the Single market: the free movement of goods, capital, services and labor.[4] The EU intends to expand its scope beyond that of trade through the adoption of a common foreign policy and a single currency, both scheduled for implementation in 1999.[5]

A treaty signed in May 1992 between the EU and the European Free Trade Association (EFTA), consisting of the countries of Sweden, Austria, Iceland, Norway, Switzerland, Finland and Liechtenstein, resulted in the creation of the European economic Area (EEA), comprising the twelve EU and the seven EFTA countries. The treaty essentially extends the four freedoms of the single market from the EU to the EFTA *upon adoption of the EU's legal framework of the single market into the national laws of the EFTA countries.* Although Switzerland and Liechtenstein currently are not members of the EEA - Switzerland because the voters have elected not to join and Liechtenstein because of its close customs union with Switzerland - the anticipated merger[6] between the twelve EU countries and the other five EFTA countries would lead to the world's largest free trade area, boasting a combined GDP almost one-fourth greater than that of the United States.[7] The EEA could one day be extended eastward to include such countries as Poland, Hungary, and the Czech and Slovak Republics.

When one considers the economic potential of the "New Europe," not only in terms of larger, more accessible markets, but also in terms of increased competition fueled by

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[4]Source 16.
[5]Source 77.
[6]Finland, Sweden Austria and Norway are scheduled to join the Union on 1 January 1995. These countries first, however, must obtain the approval from the European Parliament and their own voters. As of March 1994, in Norway opponents of membership led supporters 42% to 28%; in Sweden opponents led supporters 42% to 35%; whereas in Finland supporters led opponents 41% to 27%. Sources 66, 64 and 62.
[7]Source 13.

European firms within other international markets, one both realizes and appreciates the need to closely observe the actions of the EU and its outlying neighbors. Table 2 gives an indication of the New Europe's potential.

Nation	GNP-GDP (Billions US $)	Population (Millions)	GDP-GNP per Capita (000's US $)
EU (total)	**6,267.9**	**346.3**	**18.09**
Belgium	199.8	10.0	19.98
Denmark	130.0	5.2	25.00
France	1,197.7	57.2	20.94
Germany	1,588.0	80.3	19.78
Greece	68.6	10.3	6.66
Ireland	42.3	3.5	12.09
Italy	1,150.0	57.8	19.89
Luxembourg	9.0	.4	22.50
Netherlands	270.0	14.9	18.12
Portugal	68.8	9.8	7.02
Spain	526.2	39.1	13.46
United Kingdom	1,017.5	57.8	17.60
EFTA (total)	**868.55**	**32.82**	**26.46**
Austria*	164.1	7.8	21.04
Finland*	130.9	5.0	26.18
Iceland	6.5	.3	21.66
Liechtenstein	.65	.029	22.41
Norway*	106.9	4.2	25.45
Sweden*	230.6	8.6	26.81
Switzerland	228.9	6.9	33.17
EU Associate Status (total)	**440.4**	**38.5**	**11.44**
Czech & Slovak Republics	108.9	15.7	6.94
Hungary	60.1	10.3	5.83
Poland	162.7	38.4	4.24
Bulgaria (agreement initialed)	36.4	8.9	4.09
Romania	71.9	23.2	3.1
Seeking EU Membership (total)	**206.2**	**60.66**	**3.40**
Turkey	198.0	59.6	3.32
Cyprus	5.7	.7	8.14
Malta	2.7	.36	7.5
The New Europe (total)	**7,782.65**	**536.28**	**14.51**

*Have applied for EU membership. Data source is Embassies (1991).

Table 2. Nations Comprising the New Europe and their GDP's-GNP's[8]

[8]Source 16. U.S. embassies provided the data contained in this chart.

A closer look at the individual nations comprising the EU reveals that in terms of GDP, Germany leads with the highest total amount - $1,588.0 billion - followed by France ($1,197.7 billion), Italy ($1,150.0 billion) and the United Kingdom ($1,017.5 billion). In order to better understand the challenges facing the EU in its implementation of the Single Market, it is first helpful to review the structure of the EU's institutional framework and the roles filled by its key entities in the developing and implementation of policy.

A comparison of trade balances between the U.S. and those markets with which it most heavily trades indicates that based on the cumulative of balances between 1991 and 1993, Europe was the only region in which the U.S. posted a positive balance. Perhaps even more telling is that Europe, although accounting for roughly 25% of U.S. worldwide trade during this period, generated 78% of the total U.S. corporate international profits.

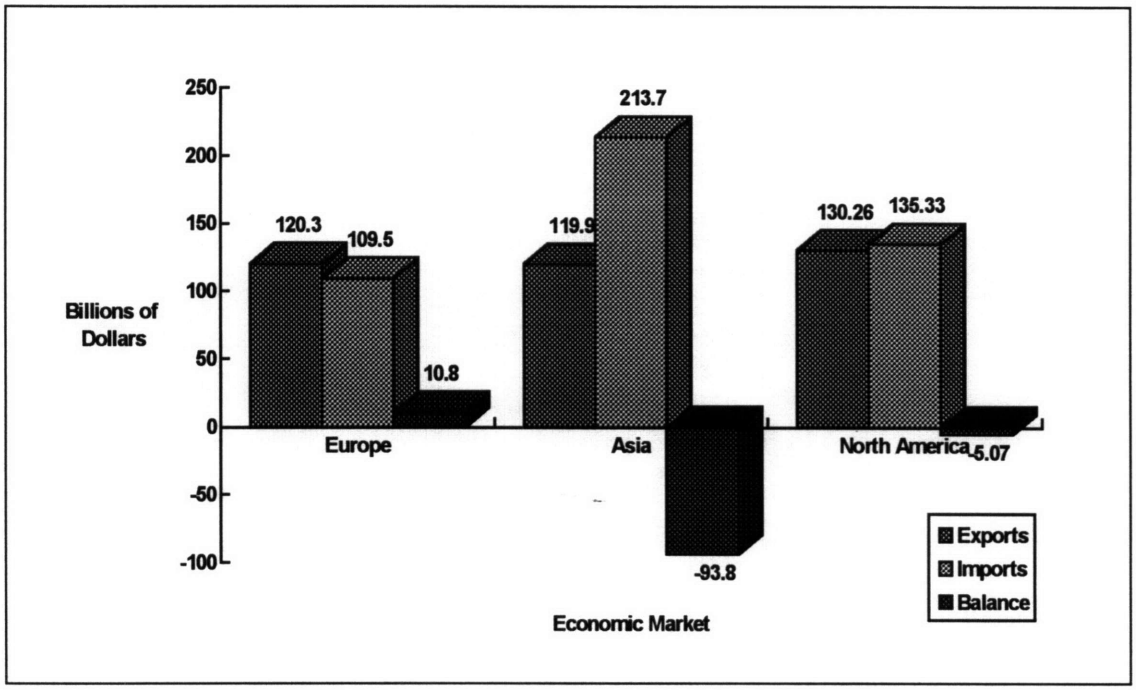

Chart 1. U.S. Trade Balances with Europe, Asia and North America, Cumulative 1991-1993[9]

[9]Source 76.

1.1 The Institutional Framework of the European Union[10]

The fundamental institutional framework of the EU consists of four separate bodies: the Commission, the Council of Ministers, the European Parliament and the Court of Justice. As discussed in this section, the combined efforts of these four bodies serves as a system of checks and balances when deciding EU policy on behalf of the community as a whole. As one might imagine, those policies and decisions that appear to benefit the community as a whole often appear to derive their merit at the "expense" of some nation's - or group of nations' - internal policies or, from a broader view, sovereignty.

The Commission, the community's executive body, consists of 17 members, two each from France, Italy, Spain, Germany and the United Kingdom, and one from each of the other countries. They are supposed to act independently from the agendas and actions of their respective national governments, always maintaining the EU's interests as their primary focus and concern.

The Council of Ministers, often referred to simply as the Council, collectively serves as the direct representative of member governments. The Council's primary concern is the deciding of policy based on proposals submitted by the Commission. Although it is the topic of policy under discussion that usually dictates which minister will represent a member country on the council, it is most often the foreign ministers who frequent the Council. Each member state is represented by one minister; however, as Table 3, indicates, the voting power of ministers varies depending on the size of his[11] country's population relative to the size of other member countries' populations. In order to reach a consensus or qualified majority, 54 votes out of a total of 76 votes are required.

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[10]Source 58.

[11]For reasons of brevity, the terms his, him, and he are not intended to denote gender.

Member Country	No. of Votes within Council
Germany, France, Italy, United Kingdom	Ten
Spain	Eight
Belgium, Netherlands, Greece, Portugal	Five
Denmark, Ireland	Three
Luxembourg	Two

Table 3. Voting Power of EU Council Members[12]

The European Parliament, consisting of 518 members, in itself has no power to initiate legislation. It can, however, amend various categories within legislation, especially those areas associated with the Single Market's completion. Amendments made by the Parliament and supported by the Commission may only be overturned by a unanimous vote from the Council.

The Court of Justice consisting of 13 members, one judge from each country, and one other, decides whether the acts of the Commission, the Council, the member governments, and other related bodies are compatible and consistent with all EU-relevant treaties and their provisions.

Policies adopted by the council most often take shape in the form of either regulations or directives. While the two often differ from a technical and legal standpoint, the primary difference between regulations and directives is most often felt in how they are acted upon and implemented at the member country level. EU regulations become regulations at the national level *upon being adopted as regulations at the EU level.* directives, on the other hand, *must be made into law by member states.* They typically take effect automatically

[12]Source 58.

throughout the EU one and one-half to two years after adoption, allowing member states sufficient time to pass into law and implement the directive.[13]

Of interest to note here is that although a member country may be slow in transposing an EU mandated directive into national law, EU *law automatically takes precedence over national law once the predetermined period of time for all member countries to act on the directive by passing it into law has expired.*[14] Without this provision it is difficult to envision the EU's legislative/governing apparatus as having any true power or ability to wield its influence at the member country level. Chart 2 summarizes by nation the percent of EU directives that have been implemented into national law as of February 1993. Please note that the information contained in Chart 2 should not be construed to represent a member state's responsiveness to laws passed from EU directives, either in terms of the affected industries following the law or in terms of a government's willingness or ability to uphold and enforce the law.

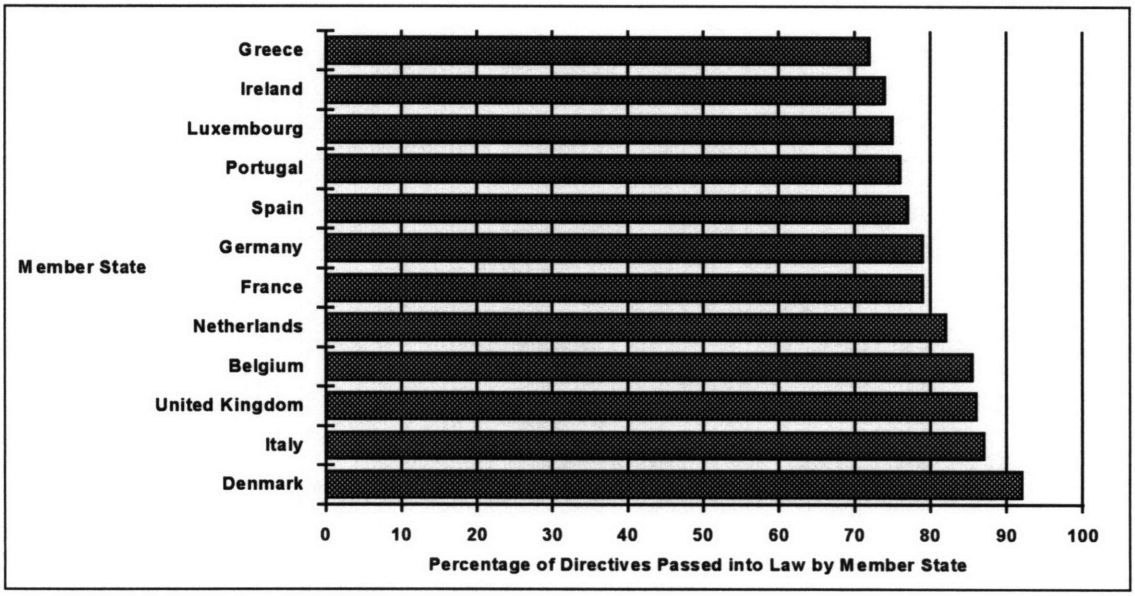

Chart 2. Single Market Directive Implementation at the Member State Level[15]

[13]Source 47.
[14]Source 58.
[15]Source 58.

1.2 A Closer Look at the Single Market

The Single Market, a term commonly used to denote that economic market found within the area comprising the member countries of the EU which is based on the principles of "free" trade, has officially been in existence since 1 January 1993. Founded on the precept that increased competition not only stimulates economic growth, but ultimately contributes to an increased standard of living within individual nations, the initiative has sought ways to reduce barriers to free trade which exist not only between but within member countries.

The goal of economic unity, however, has been elusive for Europe.[16] Although the single market actually marks its founding with the Treaty of Rome in 1957, little genuine progress resulted with the initiative until almost 30 years later. The Commission's adoption of the White Paper in 1985 symbolized Europe's resolve and commitment to escape the economic stagnation which had pervaded its economies during the prior decade. It proposed approximately 300 policy actions whose purpose was to eliminate barriers to the movement of goods, services, people and capital throughout the 12 EU nations, in time for the "official opening" of the Single Market on 1 January 1993.[17]

But not all of the 300 policy actions had been adopted in the time of the market's official opening. As of February 1993, the Commission had adopted 261 of the 282 single market directives and regulations, of which only 95 directives had been implemented by all 12 member states.[18] Despite this apparent slowness at adopting measures at the national level,

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[16]Source 16.
[17]Source 47.
[18]As of October 1993 the number of directives adopted by the Commission had risen to 264, and increase of 3 since February. Source 72.

257 of the directives are actually "in force," meaning, that although not yet officially passed into legislation at the national level, they nonetheless do exist as laws throughout the EU.[19]

The apparent slowness of the EU in enacting directives and regulations - *more so, its adverse impact on the making the Single Market a reality* - can largely be attributed to its inability to resolve differences between the views of its individual member states. This, however, is not the only challenge posed by the element of differing member state views, as revealed in the following discussion which addresses the fair implementation of directives and the issue of individual property rights.

1.2.1 The Challenge Posed by Fair Directive Implementation

Of paramount concern to the Commission is ensuring that member states implement EU directives in an "equivalent way so that businesses and consumers would benefit from the single market."[20] One area in which there exists a disparity between member states is that of sanctions imposed for violations of directives. *Since EU directives currently allow member states to determine the penalties for infractions, violations of directives and the ensuing sanctions - often differ from country to country.* What may qualify as a civil offense in Germany may qualify as a criminal offense in the United Kingdom, as is the case with a violation of the Machine Safety Directive.

A study completed in 1992 known as the Sutherland Report provides recommendations to the Commission on ways of ensuring that member states implement EU directives in an "equivalent" way. Recommendations made by the report include:[21]

1. Establishing administrative partnerships between the EU and member states.

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[19]Please refer to the discussion in Section 1.1 for further clarification.
[20]Source 47.
[21]Ibid.

2. Having each member state establish a point of contact to resolve implementation problems.

3. Forming a specific committee within the Commission to oversee the Single Market initiative.

4. Making the sanctions of member state laws for a directive more transparent.

5. Having an ombudsman appointed by each member state to settle disputes and grievances.

6. Eventually creating a new EU "public service" to enforce implementation according to EU law.

Whatever course the Commission decides to pursue in resolving the disparity between member states' sanctions they impose for directive violations, it will very likely include some if not all of the above recommendations. The one thing that is certain, however, is that the Single Market will continue to "suffer" until the issue is resolved.

1.2.2 The Integration of Services under the Single Market Initiative

According to a March 1993 report published by the U.S. Department of Commerce, the EU has "completed most of its program to integrate the service industries' markets directly related to cross-border transfer of goods, people, and capital" and that "with some exceptions, service-providing firms are free to compete EU-wide, enjoying substantial new opportunities."[22] Service industries largely affected by the directives implemented to date include financial services, tourism, airlines, freight transportation, broadcasting, advertising, value-added telecommunications, information services and professional services. This section highlights the salient features of some of these markets.

[22]Source 16.

In the area of **financial services**, the integration and unification of the banking, securities and insurance sectors is underway through the adoption of more than 20 directives to date. The main principle that the integration of these markets is founded on is the "passport license," allowing an entity authorized in that member state where it is first established to open branches within other member states. Host countries must honor home country authorizations and are not permitted to apply separate banking rules. Another feature of all financial service directives is a "reciprocal national treatment clause" whose purpose is to ensure that EU market liberalizations and benefits are bestowed in a like manner to EU as well as non-EU banks.[23]

In the area of **transportation services**, most of the EU-wide program is now in place except for that portion which addresses road haulage cabotage. National regulations which have limited the free movement of goods have gradually disappeared, permitting freight movement by roads to grow relatively unhampered for the last several years. Quantitative restrictions on transport between member states has been eliminated as of January 1993, and the Union has issued authorizations enabling road haulers "who are nationals of one member state to carry goods anywhere within the EC."[24] Border controls have been practically abolished with stops now limited solely to legal matters, such as checking for drug trafficking and illegal immigration. Differences within transportation services not yet resolved include the harmonization of vehicle taxes and the presence of unlimited cabotage authority, allowing a trucker from one member state to haul cargo between points in another member state.[25]

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[23]Source 16.
[24]Source 16.
[25]Source 16.

The EU has also integrated air cargo and passenger services, extending benefits to EU carriers but not to carriers from other countries. The Union's program calls for the privatization of all rail freight services and the development of a new higher speed rail network, hoping in time to not only alleviate the congestion on the roads and within the air, but to assist in preserving the environment.[26]

Professional services, covering the disciplines of law, accounting and consulting, is an area that will likely realize more economic benefit than will any other service-related field. The demand for all of these services is likely to continue to increase as does the "direction and intensity of change in the new business and economic structure of Europe."[27] The Mutual recognition of Professional Qualifications Directive provides for the free movement of professionals throughout the Union. The export of U.S. professional services has increased markedly in recent years, as is evident from a 50% increase from 1989 to 1990 and a 100% increase from 1991 to 1990.[28]

1.2.3 Pursuance of Monetary Unity: The Treaty of Maastricht

To assist in furthering the reality of economic unity the EU has also been pursuing monitary unity, primarily through the accords and provisions contained within the Maastricht Treaty. The treaty, signed by the prime ministers and presidents of the EU member states in December 1991 in the southeastern Dutch city of Maastricht, could not be brought into force until the 12 parliaments likewise gave their approval.[29]

But ratification of the treaty within certain member states has been anything but easy. The treaty passed in Denmark by a very narrow margin only after failing its first test at a

[26]Source 16.
[27]Source 16.
[28]Source 16.
[29]Source 25.

referendum in June 1992. It passed a French referendum by "the narrowest of margins" and was only endorsed by Britain's Conservative-dominated Parliament when Prime Minister John Majors threatened to resign. With the ruling of Germany's highest court in October 1993 that the treaty is not in violation of the German constitution and its subsequent ratification by the German legislature, the pact essentially has been in force since 1 November 1993. With passage of the treaty behind them, the EU is now in a position to establish its new European Monetary Institute, which under the accord officially comes into being on 1 January 1994. The Institute's main focus will be the coordinating the next phase of the EU's plan to unify Europe, both economically and monetarily. The Institute, viewed by many as "the forerunner of a central European bank," will likely be located in Frankfurt, Germany.[30]

One of the main provisions of the Maastricht Treaty, the creation of a single European currency by the end of the century, is now considered unrealistic, especially in light of the virtual collapse of Europe's currency exchange grid which occurred during the summer of 1993. The EU's 14 year old exchange rate mechanism (ERM), which had enjoyed a period of remarkable stability during the five years prior to the summer of 1993, began to come "unhinged" in the Fall of 1992 as "currency traders lost faith in EU members' ability to move toward similar economic performances, a prerequisite for approaching a single currency."[31]

The reality that member states will act first to guard their own national, sovereign interests was once again apparent when two member states, Britain and Italy, pulled their currencies out of the framework provided by the ERM, subsequently leading to the ERM's unhinging. Britain's move to disengage its currency from the ERM is attributed primarily to a clash in

[30]Source 25.
[31]Source 29.

its policy aims with those of Germany's. In an attempt to extinguish the inflationary effects spurred by the economic growth brought about by its reunification, Germany's Bundesbank acted to keep interest rates high. This policy, however, was in direct contradiction to both the lower interest rates and the weaker currency that Britain sought - and desperately felt were needed - in order to stimulate its weak economy (through increased industry investment and increased exports). Stating in May of 1993 that "we've made it clear that we are not going to rejoin the ERM quickly....it may be two years, it may be three years, or it may be even longer," Britain's Chancellor of the Exchequer, Mr. Norman Lamont, communicated Britain's resolve, in that it is not likely to even reconsider joining the ERM until its economic cycle is synchronized with that of the continent.[32] Incidentally, the boom in exports achieved by Great Britain and Italy through the devaluation of currencies in breaking from the ERM is now[33] finished and growth in exports will now have to come almost exclusively from increased demand.

But passage of the Maastricht Treaty by all member states' parliaments is nonetheless viewed as significant progress toward the goals of monetary, as well as economic, unity and well being. In the words of Mr. Jacques Delors, President of the EU Commission, the treaty's entry into force would

> allow the Community to end a period of waiting and moroseness and give the new impetus that is so necessary in the fight against economic stagnation and unemployment as well as reinforcing the continent's security.[34]

[32]Source 29.
[33]As of Spring 1994. Source 31.
[34]Source 25.

If there is any one thing that the EU currently needs it is a stimulus for economic growth and employment as will be addressed in the following section.

1.3 Challenges Posed by the Current Economic State of the EU

Any report addressing the economic potential of the EU and its member states would be incomplete were the serious challenges facing the Union in the three inter-related areas of industrial competitiveness, productivity and unemployment not addressed. These three areas not only impact the ability of Europe's industries to compete within global markets but furthermore affect the formulation of internal policy, at the Union as well as at the national levels, in turn influencing the implementation of the Single Market.

The EU's GDP during 1993 experienced its first decline since the peak of the oil crisis in 1974[35] - by .75% - and it is anticipated that it will increase only 1.3% in 1994.[36] The EU's jobless rate fared no better at 11% in 1993 (21.3 % in Spain, 15.2 % in eastern Germany, 11.0 % in France and 7.5 % in western Germany)[37] and is estimated to top 12% during 1994.[38] The projected percentages of change in the real GDP's of the EU's leading economies for 1993 are summarized in Chart 3 on the following page.

The concern that the competitiveness of EU member states is on the decline was recently reinforced by a report published by the Geneva-based World Economic Forum. In the Forum's annual ranking of industrialized and newly-industrialized countries, Germany has fallen from the No. 2 position to the No. 5 position in the category of "overall competitiveness." The U.S., Denmark and Switzerland, have surpassed it and rank No. 2,

[35]Source 44.
[36]Source 31.
[37]Data is for July and August 1993.
[38]Source 24.

No. 3 and No. 4, respectively, whereas Japan maintains its position as No. 1. Chart 4 summarizes the results of the Forum's findings.

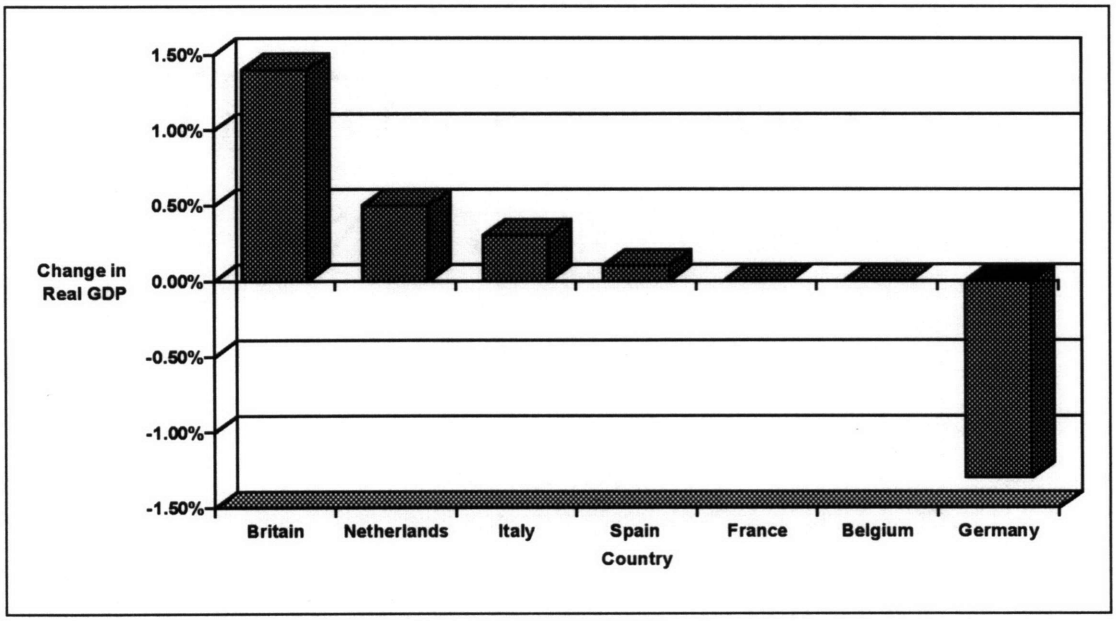

Chart 3. Projected Percentage Change in Leading EU Economies, 1993[39]

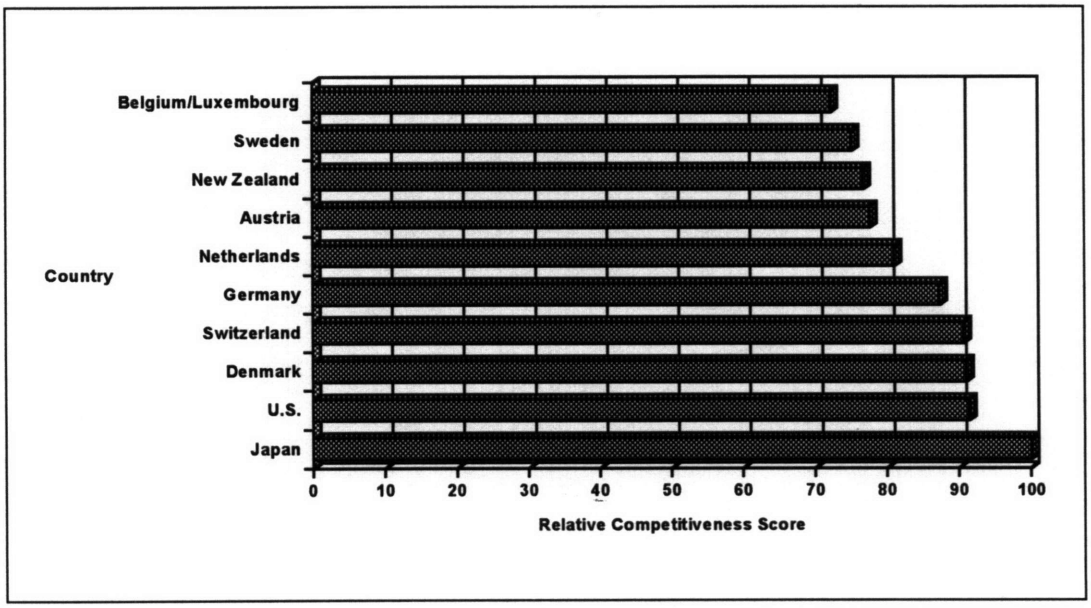

Chart 4. The Ten Most Competitive Countries in 1993, According to the World Economic Forum[40]

[39]Source 61.

The major culprits contributing to both the sluggish rate of economic growth and the lack of competitiveness of EU firms within international markets are the high employment costs--direct and indirect--and the generous system of workers' and unemployment benefits. European labor is as much as 50% more expensive than that of its competitors; the main difference not being in hourly wages, but in the social benefits paid by employers.

In Germany the average manufacturing worker--the highest paid in Europe--received $26.89 an hour in wages and benefits during 1992. Of this amount, $12.47, or over 46%, came in the form of social benefits, which consists primarily of health insurance and pension funding. In Italy the workers actually receive more benefits than wages in their $21.09 hourly compensation. In sharp contrast only 28% of the average worker's compensation in the U.S. is in benefits ($4.44 of $15.89).[41] Chart 5 compares the trend of the rise in labor costs[42] between Germany, France, Japan and the U.S. from the period 1970 to 1993.

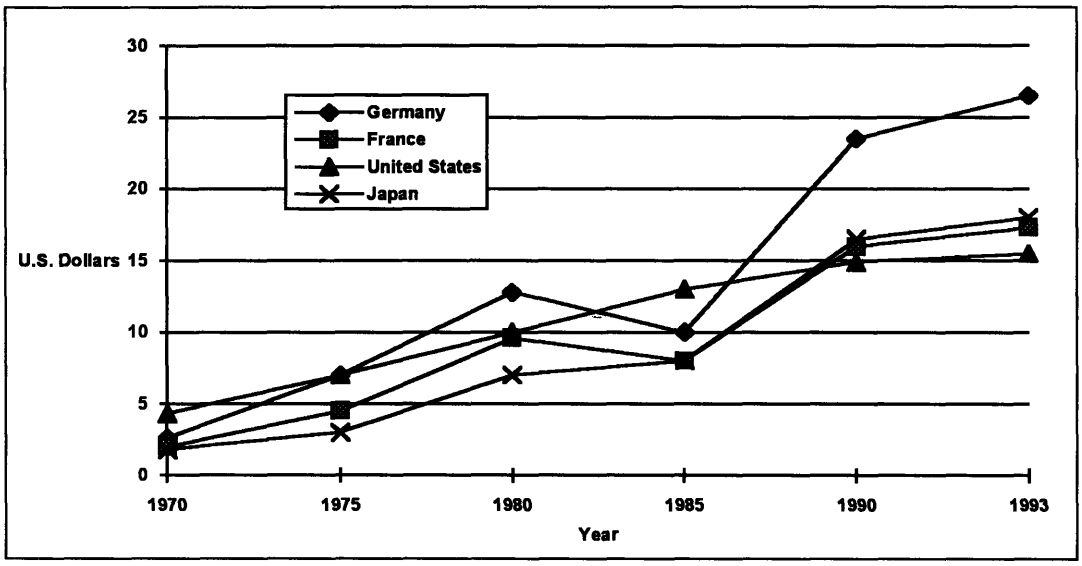

Chart 5. Labor Costs of Selected Countries, 1970-1993[43]

[40]Japan retained this position despite a decrease in certain measures such as executive optimism, internationalization and confidence in government. Information is from Source 25.
[41]Source 44.
[42]In terms of labor costs (plus benefits) per hour.
[43]Source 15.

The longer vacations and shorter work weeks enjoyed by Europeans also contribute to the higher operating costs of their businesses, resulting in either "a squeezing of profits or an increase in prices which drives them out of the market."[44] In 1992 the average German worker spent 1,519 hours at work and took 40 days of paid vacation. The average French worker in 1992 clocked 1,646 hours at work, whereas his counterparts in the U.S. and Japan for the same period worked an average of 1,857 and 2,007 hours, respectively. When viewed from the perspective of unit labor costs, not surprisingly a similar picture results. During 1992 alone, EU unit labor costs grew 4.1%, easily outpacing rises of 1.4% in the U.S. and 2.4% in Japan.[45]

In the area of unemployment benefits, information released in 1993 by the National Bureau of economic Research suggests that several member states' governments subsidize the unemployment by providing a relatively generous system of benefits. In 1991, for example, 6% of jobless Americans were out of work for a year or more, compared to 37% in France and 51% in Spain.[46] Although the U.S.'s unemployment rate in the late 1980's was less than that in major EU countries, a look at the long-term unemployment rate in 1989 is alarmingly revealing. In 1989 only 1.2% of the U.S. labor force was without work for 13 weeks or longer. This compares with 8.1% for France, 7.3% for Italy, 6.9% for the Netherlands, 5.2% for Britain and 4.6% for Germany. Perhaps even more revealing is that more than half of those without work in the EU were unemployed for a year or longer; whereas in the U.S. the figure is only one in sixteen. Not only do the unemployment benefits programs of these countries discourage the unemployed from seeking work, but

[44]Source 23.
[45]Source 23.
[46]Source 25.

the elaborate system of government regulations imposed on employers further serves to discourage hiring.[47]

As if these factors alone are not enough to catch the attention of the management within European businesses, the grim situation and less than attractive outlook for many firms has come at a time when "new competition from the Pacific Rim, a revitalized U.S. industry and cheaper producers in work-hungry Eastern Europe are cutting into European producers' profits."[48] The Vice-President for Industrial Policy at the European Union Commission, Mr. Martin Bangemann, observed:

> I wish everyone in the community would accept that the first goal in 1993 and for the next 10 years has to be to improve the competitiveness of European industry. You can only support higher labor costs if you have higher productivity. And that isn't the case today the way it was years ago.[49]

His opinion is now gaining wide-spread acceptance as more and more policy makers within the EU come to accept the painful, extremely "electorate sensitive" truth about reinstilling competitiveness within European industry. An improvement of the existing situation will likely require a combination of "trimming government spending, cutting taxes, scraping the keels of industry by deregulating labor markets and cutting social contributions that add to employees paychecks."[50] Along these lines, the burden of taxes and obligatory social security payments - factors that clearly affect a nation's level of economic competitiveness, reflected in the performance of its industries - for three of the EU's four leading economic

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[47]Source 78. For a fairly detailed account of the bureaucracy that surrounds employment regulations in many EU countries read "Eurosclerosis Spreads to Our Shores," by Mr. David Henderson, 14 October Wall Street Journal.
[48]Source 44.
[49]Source 44.
[50]Source 44.

states is quite heavy. Chart 6 compares these burdens as a percent of GNP for selected countries.

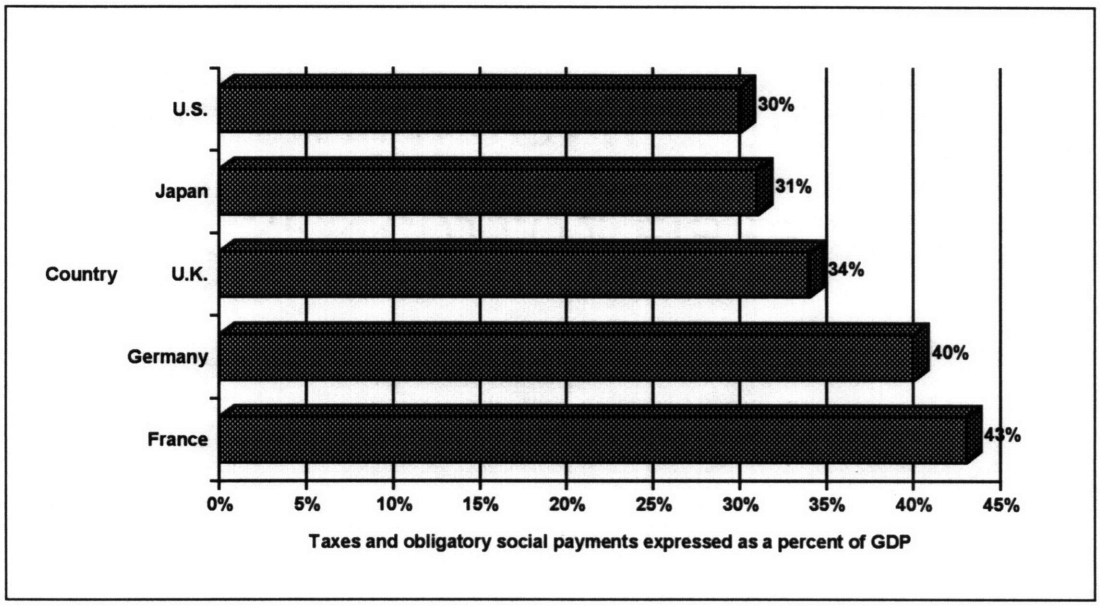

Chart 6. Taxes and Obligatory Social Payments for Selected Countries, as a Percent of GDP[51]

Progress already made in reducing the intra-EU obstacles in an attempt to make the Single Market more competitive could potentially be altered or compromised in light of the Commission's announcement in October 1993 that they may approve "competition restricting agreements between businesses" if such arrangements contribute to increased productivity while assuring that consumers reap a fair share of the cost savings.[52] Such agreements can only be viewed as a threat to the free market principles upon which the Single Market is supposedly founded, again underscoring the obstructive role that individual member states' interests can play to the market.

At the time of this thesis' writing, Europe appears to be pulling out of its recession. At current estimates, Great Britain's growth rate in 1994 - anticipated to be 2.5% - will be

[51]Source 28. This source drew from a European Commission White Paper on Competitiveness for this information.
[52]Source 61.

matched or exceeded in 1995 by France, Italy and Germany. Growth at such rates could provide the leeway, without the risk of political backlash, needed by elected officials to tackle those problems exposed by the recession that have most affected European industries' competitiveness: labor market rigidities, excessive corporate taxes and overly rich social programs. Confronting these issues head-on could lead Europe "to healthier finances and still-lower interest rates....that could turn the nascent recovery into a vigorous expansion."[53] Recent moves within Germany, France and Italy, however, indicate that elected officials may not yet be willing to take such measures, as evidenced by a recent round of higher taxes and fiscal tightening.[54]

1.4 Summary

The emergence of the EU as a viable economic force is apparent, both in the size of its own internal market and in the competitive role its industries play within the individual markets around the globe. Its own Single Market initiative, a bold attempt to break down the barriers that for so many years have inhibited the free flow of goods, capital, services and labor across the borders of its member states, has made significant progress in many areas but certainly has some way to go before being able to realize its full potential. A major obstacle to the initiative - indeed to any initiatives that the EU attempts to implement - is the EU's inability to coalesce the individual views and principles of its member states into those of one coherent, functioning unified body. The dire state that many European industries currently find themselves in, in terms of productivity, employment and overall competitiveness, only acts to make more difficult the implementation of an initiative that is, by its very nature, already full of unique problems and challenges.

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[53]Source 31.
[54]Source 31.

But while the challenges and issues posed by the Single Market initiative are very real and do, in part, appear to adversely affect the prospects for some businesses (primarily in the short-term), the vast majority of industries and businesses will ultimately benefit from the program's implementation.

One sector that is clearly affected and stands to potentially benefit from the Single Market initiative is that of construction. How is the market leading to increased opportunities for firms operating in Europe and, perhaps more importantly, how are the products and processes of the industry be affected in the face of change? The answers to these two questions are the focus of subsequent chapters of this thesis.

2.0 Europe's Construction Market in Light of the Single Market

The size of the European construction sector is substantial, accounting for 25% of the world market and $330 billion in 1991 alone. According to Construction Europe it is "the largest single market of its kind in the world" and "it is fair to assume that the value of construction in geographical Europe is around ECU 900 billion."[55] Chart 7 approximates how the construction sector is sub-divided.

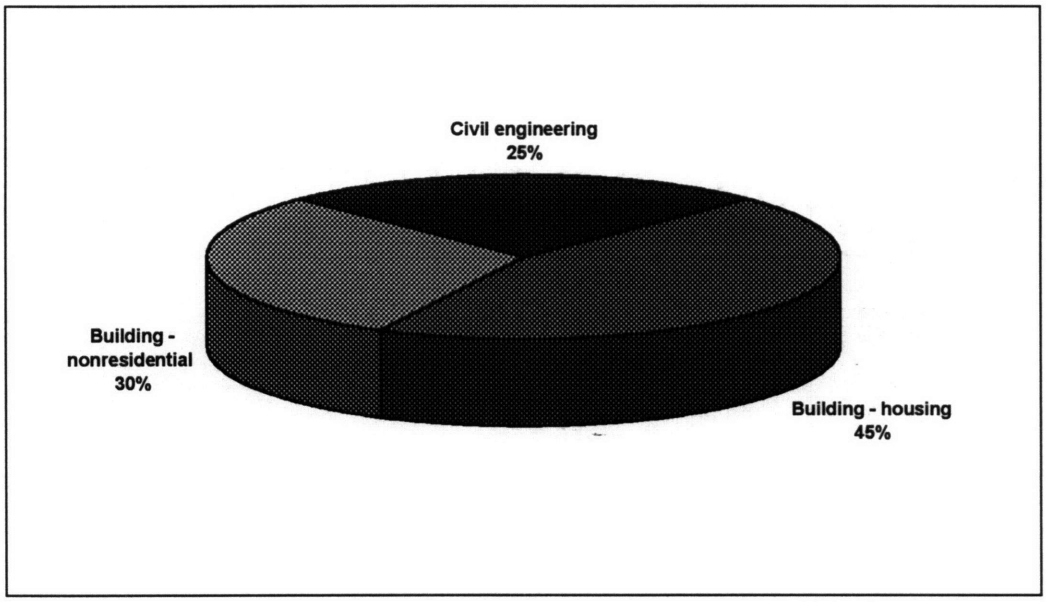

Chart 7. Sectors within Europe's Construction Industry[56]

It is estimated that within Europe alone, over eight million people are employed by an enterprise directly related to construction. Furthermore, the employment of an additional thirty million people relies indirectly on the construction industry, primarily in the manufacture and production of construction materials and supplies.[57]

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[55]Source 67. The term ECU stands for European Currency Unit. There are approximately .90 ECU's per dollar.
[56]Source 2.
[57]Source 14.

As is the case in the United States - indeed throughout most of the world - the construction industry is extremely fractured, resulting in the majority of the construction companies within Europe employing relatively few workers. Of the 1,102,150 construction enterprises active within the EU during 1985,[58] less than .6% (6,150) employed more than 100 workers whereas over 90% (1,000,000) employed between 1 and 10 workers.[59]

The industry's performance in recent years has been strongly influenced by market activities within the country's of Germany, France, Italy, the United Kingdom and Spain. In terms of regional trends, the combined effect of governmental influences and simple market forces cause the European construction sector to be one of the most diverse and varied in the world, making accurate predictions of its activities difficult at best.[60] When viewing the European construction market as a whole, most forecasters agree that the sectors of residential and repair and maintenance will continue to experience positive growth through 1994, while the sectors of non-residential and civil engineering will show slight declines. The decline in the civil engineering sector within Europe is due almost solely to the postponement of virtually all civil engineering activities in Italy during 1993.[61]

The recession that has gripped Europe--indeed most of the world--in recent years has also taken its toll on the construction market, as Chart 8 on the following page indicates. While the market in 1993 for the most part was either stagnant or declined slightly, most experts agree that the prospects for 1994 are better, especially in light of the outlook for increased growth within the European economy in general. At this time some of the more telling trends within the construction markets of the more influential countries will be highlighted.

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[58]Although somewhat dated, these proportions have not changed significantly since this time.
[59]Source 2.
[60]Source 67.
[61]Source 67.

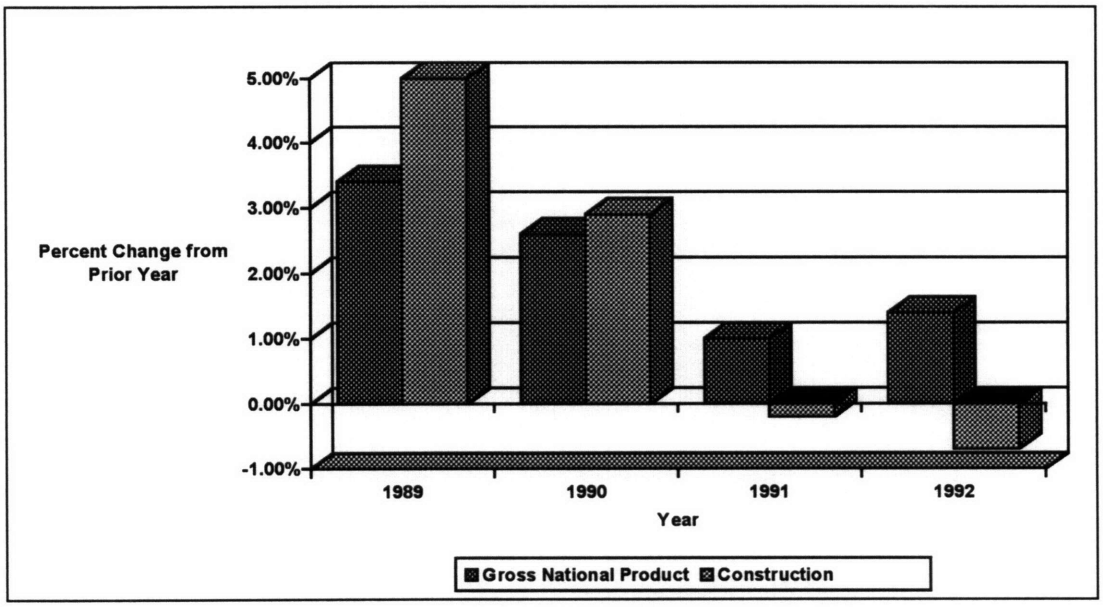

Chart 8. Changes in Gross National Product and Construction Volume, 1989-1992[62]

The **German** market is the largest single market within all of Europe, registering 4.0% and 3.6% growth in 1992 and 1993, respectively, and a total output in 1993 of approximately 230 billion ECU. Despite some cuts in public spending announced in 1993, the industry should still sustain expansion due to increased demand in private residential and commercial contracts *within the western states.* Construction output in the eastern states surprisingly accounted for only 12% of the total output for Germany in 1993, but is expected to increase by between 15 and 20% for 1994. One forecast cited in Construction Europe states that, in order to bring the eastern region's standards up to that of the west's by the year 2005, the industry in the eastern region will have to be expanded by 600%.[63]

The situations and short term outlook within **France, Italy and the United Kingdom** are quite different than those in Germany. Political problems, that have implicated influential members within not only the Italian government but the construction industry, have

[62]Source 43.

[63]Source 67. Note that many of the figures for 1993 are reasonable, best-guess values, as detailed information is not yet available.

postponed many public works contracts and "knocked the Italian construction industry into a dangerous spinning tail dive,"[64] making the outlook, at best, difficult to predict. The French construction industry, on the other hand, has its own problems to contend with. Facing the possibility of cuts in public spending, the construction lobby will likely bring "significant pressure to bear on its government to maintain investment."[65] Although the industry as a whole contracted, some sectors within the French construction industry, such as housing and some public investment areas, exhibited growth in 1993. "Renewed signs of optimism" perhaps best describes the outlook for the construction sector during the near-term in the **United Kingdom**. Although the market has neither contracted or expanded in 1993, the outlook for 1994 is more positive, with growth anticipated in several sectors.[66]

In terms of construction contract awards for new work within the international market during 1992, Europe, along with Asia, were the only two regions of the seven listed by Engineering News-Record that registered an increase over 1991. Contract awards for new work in Europe during 1992 increased by 5% to $34.4 billion, whereas in Asia the increase was more substantial at 23% to $42.6 billion. In sharp contrast North America[67] posted a total of $13.1 billion, reflecting a net decrease over the prior year of approximately 30%.[68] Table 4 on the following page highlights the performance of the construction sectors of various European countries.

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[64]Source 67.
[65]Source 67.
[66]Source 67.
[67]Comprising the U.S. and Canada in this case.
[68]Source 42.

Country	1992 Output (in billions ECU's)	1993 Output (in billions of ECU's)	% Change
Germany (western)	193	194	+0.5
Germany (eastern)	27	34	+27.0
Germany* (total)	220	228	+3.6
France*	115	114	-1.0
Italy*	115	103	-10.3
United Kingdom*	68	68	0.0
Spain*	51	50	-2.0
Netherlands*	29.8	29.5	-1.0
Switzerland	25.8	25.6	-0.5
Austria	24.2	25.0	+3.5
Sweden	24.0	21.5	-10.0
Belgium*	19.1	18.7	-2.0
Finland	15.0	13.5	-10.0
Denmark*	9.0	9.6	+6.7
Norway	8.9	8.9	0.0
Portugal*	8.7	8.8	+1.5
Ireland*	4.4	4.3	-2.2

*EC member state.

Table 4. Estimated Construction Output of European Countries, 1992 & 1993

Europe posted more activity - in terms of total billings - within the international design-related services market in 1992 than did any other region in the world. Design-related services within the international market in Europe during 1992 totaled $3.69 billion, representing an increase of 34% over 1991; Asia posted a not too distant second with an increase of 10% and a total of $2.98 billion in activity. In terms of the greatest amount of growth over the prior period though, Latin America posted an increase of 49% with a total

of $1.11 billion. In North America though, the combined results of the U.S. and Canada show a decrease of approximately 6% with a total amount of about $1.4 billion.[69]

A significant portion of the increase in activity within the EU's construction market that occurred during the period leading up to the Single Market's opening was the result of the market's creation. While the catalyst for much of the activity was and will continue to be creation of the Single Market, a sizable portion of the work created is the direct result of inadequate maintenance of infrastructures, changes in demographics, and other factors occurring at the national level. The balance of this chapter will address many of the activities existing within the construction market, whether arising to assist directly in making the Single Market more efficient or occurring strictly as a matter of individual member state action. These opportunities will be addressed under the headings of infrastructure and environment.

2.1 The EU and Its Infrastructure

In order to assist the Single Market in attaining its goal of enabling the free flow of goods, capital, services and labor within and between EU member states, the Commission cites four factors that affect how the infrastructure--primarily transportation in an "integrated trans-European network"[70]--is to be planned and improved. These four factors - volume effect, dimension effect, cohesion effect and a quality requirement - are summarized in Table 5.

The Commission dedicated in excess of $150 billion for work between 1991 and 1995 to be spent primarily on projects that improve both the infrastructures and environmental

[69]Source 37.
[70]Source 17.

conditions of member states. The majority of the funds in this package are directed toward improving the infrastructures within those countries exhibiting the greatest need: Greece, Ireland, Portugal and Spain.[71]

Factor	Explanation
-Volume Effect	An increase in trade due to the decrease in barriers results in an increase in the volume of traffic.
-Dimension Effect	The need for infrastructures in all member states to match the cross-border, Union dimensions within the areas of design & development.
-Cohesion Effect	The need to unify outlying regions with the rest of the Union.
-Quality Requirement	The need for consistently high quality throughout the Union.

Table 5. Four Factors Affecting the Planning and Improvement of Infrastructure[72]

In a meeting conducted between the leaders of the twelve EU countries in December 1993 it was decided that $22 billion annually over the next six years[73] would be dedicated to "public works projects that they hope will boost their economies and improve their competitiveness." The money[74] is supposed to be used to supplement private sector investment and will go towards the construction of high-speed train links, new highways, gas and electricity grids, and high-tech information and communications networks.[75]

Germany's efforts to integrate & improve the infrastructures of its recently democratized eastern states with those in the west substantially contributed to a public sector deficit of $70 billion in 1992 and is expected to match - if not exceed - this figure in 1993. Public

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[71]Source 17.
[72]Source 17.
[73]1994 through 1999.
[74]Of the $22 billion to be spent annually, $13.6 billion already exists in the form of cash allocations, loans and guarantees. The additional funding has been the source of heated controversy, in particular the result of a recommendation by Mr. Delors, the EU commission president, when he stated the funds could be raised through the floating of so-called Union Bonds.
[75]Source 27.

sector borrowing markedly jumped from a level of 1.5% of GNP in 1989 to a level of 5.7% of GNP in 1992.[76] The construction sector in the eastern states achieved 20% growth in 1992 and is expected to expand an additional 30% in 1993. In the eastern states non-residential construction accounts for the majority of the growth, with residential construction experiencing a much slower rate of growth. Actual expenditures in the construction market of eastern Germany in 1993 was approximately $40 billion.[77] It has been estimated that total expenditures to bring the eastern states in line with western standards by the year 2005 will amount to $1.25 trillion.[78]

In order to bring the **transportation** infrastructure within eastern Germany up to par with the system in the states to the west - in addition to handling increased traffic due to the budding free markets of the former East Block - a substantial amount of the estimated $1.25 trillion dollars to be spent prior to the year 2005 will go towards improving and rebuilding the roads, rails and airports in the region.[79] The German government has established a private firm, referred to as DEGES, to oversee an accelerated construction program focused on bringing the roads in eastern Germany up to western German standards. The accelerated program's goal is to compress a 20 to 25 year program into five years.[80]

According to the U.S. Department of Commerce, Portugal alone is targeted to receive more than $30 billion from the EU to commit towards the development of its infrastructure between 1993 and 1999. These funds will be directed primarily toward the sectors of transportation and environmental protection.[81] Greece will receive more than

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[76]Source 55.
[77]Source 13. Based on best available current data.
[78]Source 32.
[79]Source 32.
[80]Source 69.
[81]Source 13.

$24 billion from the EU - almost double of what it received between 1988 and 1993 - to invest during the same period on improvements of its infrastructure. The transportation sector will receive a significant portion of the funds to commit to projects which not only will upgrade but construct airports, bridges, ports, highways, tunnels, canals and its subway/railway systems.[82] In all, the funds will create 3,000 projects at the national level and over 7,000 at the regional level within Greece alone, many falling within or affecting the transportation sector. The remaining balance of its funds is to go toward upgrading the country's power infrastructure with the construction of 14 power units and 12 substations.[83]

To facilitate the need to move more people between member states and major urban areas it has been determined that approximately 15,000 miles of new or upgraded high-speed rail lines are required throughout Europe. At the national level, the Italian state rail authority intends to invest ECU 9 billion in improving its rail networks and facilities within major Italian cities to help satisfy the demand brought about by an increase in the flow of both goods and people.

Efforts are underway to not only establish transportation links within the EU but to improve the links with the EU and its neighboring countries. One such example of this movement will result in the first direct land connection between Sweden, a member of EFTA who has also applied for EU membership, and western continental Europe, specifically Denmark. The estimated $1.8 billion project will consist of three to five separate construction projects directed toward "bridging" the 9.5 mile distance separating Denmark and Sweden. Work on the Danish side will include a .4 mile long peninsula joined to a 2.5 mile stretch of artificial islands by a 1.9 mile long immersed-tube tunnel.

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[82]Source 70.
[83]Source 70.

The work on the Swedish side will consist of 4.7 miles of structures to include a major cable stayed bridge with a 1,608 feet main span. The link will provide movement by both road and rail as current plans include a twin-track railroad in addition to a four lane highway.[84]

But as is often the case with publicly sponsored infrastructure projects, bridging the wide gap between identifying the need - which is often the simplest step of the process - and delivering the end product or service, is problematic because of fiscal realities: from *where* will the money come? Financially-strapped federal and local governments within Germany, Italy, Britain and France are to be leaning increasingly toward pursuing forms of **privatization** as sources of funds for public works, particularly for existing and planned road and rail systems.

Of the options being considered by the governments of the four countries, perhaps that being considered by the Germans is the boldest and most interesting. The Germans have estimated that a total of $6 billion could be raised annually through the progressive sale of stock (ultimately 49.9%) in a yet-to-be created agency which would own all autobahns[85] throughout Germany. This money in turn would go toward reducing the $434 billion debt held by the state-owned railroad companies of both the eastern and western states, permitting the privatization of the railroad companies. Another use of the funds raised by privatizing portions of the autobahns would be to finance future railroad and autobahn infrastructure projects. The government has already rejected a bolder proposal put forth by the German construction federation, Hauptverband der Deutschen Bauindustrie, which called for a pilot build-operate-transfer (BOT) road project. Another idea for raising large volumes of badly needed transportation infrastructure funds that is being seriously

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[84]Source 52.

[85]Autobahns are the equivalent of interstate highways in the U.S..

considered is enacting an annual fee for Autobahn access, a system already in place in Switzerland where automobiles using the autobahns must display an annual sticker costing upwards of $50 per year, which would ultimately be replaced by a computerized toll system.[86]

Federal deficits in Italy, a country where only 5% of the power generation and none of the transportation are in private hands, are compelling the government to restructure state-owned groups into private operations. The first significant project combining public and private funding will be the $15 billion high-speed rail link between six major cities. The project is being handled by TAV SpA, a joint venture between the state owned railroad and financial institutions.[87]

Britain's Department of Transport (DOT) is acting to make BOT a more plausible means of undertaking projects by scrapping rules that made it difficult for developers to use BOT. The DOT has even gone so far as "to publish a major policy document which encourages public-private partnerships in projects that need subsidies to survive commercially."[88] The DOT is also promoting legislation that would privatize the country's railroads which were nationalized 45 years ago. The current scheme calls for the government to own the railroad infrastructure, yet to sell the freight businesses and franchise the seven passenger networks.[89]

In France six large construction groups have formed a joint venture to construct a "30 mile three level transportation tunnel" around the west side of Paris. The project, known as the Maille Urbaine Souterraine Express (MUSE), is estimated to cost $5 billion and will employ

[86]Source 40.
[87]Source 40.
[88]Source 40.
[89]Source 40.

a BOT strategy . The BOT joint venture, led by Bouygues SA and the SGE Group, is to perform the project for the local authority Conseil Général des Hautes-de-Seine (CGHS) and expects to complete the project in the year 2015, after which it will operate the system (tunnel) on a concessionary basis for a period of 50 years.[90]

The German **telecommunications** sector is scheduled to spend approximately $134 billion by 1997 to upgrade its infrastructure and system; $34 billion within eastern Germany and the remainder within the western states. The existence of the state-owned telecommunications monopoly *Deutsches Bundespost Telekom* (DBP Telekom), precludes many foreign firms from accessing this market (the telecommunications market), but as the telecommunications monopoly moves towards deregulation, "competitive out-sourcing, privatization, and whole market segments may be liberalized and opened to international competition."[91] Of course one benefactor of such an extensive and expensive venture to modernize and upgrade will be the construction industry and those related sectors of the industry that contribute to its growth and existence.

2.2 The EU and the Environment

Environmental related issues only began emerging as a major focus of the EU in the early 1990's. Decades of wide-spread, unchecked abuse inflicted by many industries on the environment, such as what resulted from the mining and use of coal, has surfaced the need not only to remedy existing hazards but to adopt the directives & procedures necessary to limit and check further abuse of the environment. To help in establishing some basis for reference in measuring the scope of the problem[92] it is interesting to note that the total

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[90]Source 54.

[91]Source 13.

[92]The problem does vary in level of seriousness and degree of scope from member state to member state and even between regions within member states. Due to its status as a former Soviet Block country, the states comprising

costs for all legally mandated environmental clean-ups and investment in eastern Germany alone - an area less than one-half the size of the state of Oregon, yet containing over eight times the number of people - is estimated to be $130 billion.[93] While as yet there is no length of time attached to this figure, it is interesting to contrast this scenario with that existing in the U.S., where it is estimated that U.S. government and industry will spend more than $200 billion on environmental clean-up before the year 2013.[94]

A study released in 1993 by the Portuguese Ministry of Environment and Natural Resources states that Portugal, considered the most polluted of EU countries and having waste problems resembling those found in eastern Europe, will spend at least $15 billion in EU provided funds on pollution clean-up and control through 1999. Having targeted the cement, metallurgical, ceramics and tanning industries, the Portuguese government intends to force its country's primary industries to either clean up or suffer hefty fines.[95]

The many challenges surrounding achieving and sustaining clean & plentiful water supplies have in several member states moved to the forefront of their environmental concern's agenda. The experiences of the United Kingdom in this area serve to illustrate many of the issues and concerns being addressed at the member state level in the context of the environment.

In the U.K. the combination of new EU water quality standards, new evidence of contaminants in drinking water supplies, and "assessments of the environmental and

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eastern Germany, not surprising, are one of the more costly areas within the EU requiring environmental clean-up and investment.

[93]Sources 12, 4 & 5. There are approximately 41,800 square miles in eastern Germany compared to 96,980 in the state of Oregon. Eastern Germany has approximately 18.5 million inhabitants whereas Oregon has approximately 2.5 million inhabitants. The clean up costs are not necessarily driven by action at the Union level, but actions rather at the national level.

[94]Source 34.

[95]Source 56.

economic consequences of declining supplies of clean water"[96] have spurred national authorities into in depth planning and action. Recent tests conducted in the U.K. indicate that high levels of lead are making their way into the water that reaches many homes. The problem is attributed mainly to the widespread use of lead pipes in plumbing but is complicated in some regions, particularly in northwest England, where high levels of lead are found naturally in the soil due to the region's local geology. One sample of the tap water in the region of Lancashire indicated that the EU standard of 50 micrograms per liter of water (the recommended maximum amount according to the World Health Organization is 10 micrograms per liter of water) was exceeded by over *1,700 times*, whereas several other samples exceeded 50,000 micrograms per liter.[97]

Growing criticism over the British water industry's response to lead contamination, coupled with the threat of action in the European Court, led the government to promise in 1989 that by 1992 all British water supplies would comply with the EU standard. Interim attempts appear to have not solved the problem and there is now general agreement among industry scientists that a national program to remove lead plumbing is needed in order to make significant progress toward resolving the issue.[98]

The existence of high levels of nitrates in U.K. water due primarily to the use of nitrate based fertilizers is receiving similar attention. It is estimated that of the 1.6 million tons of nitrate based fertilizers applied to U.K. crops each year, anywhere between 16 and 96 million tons (between 10 & 60 percent) are not taken up by the crops upon which it is applied. Not surprising, that nitrate which is not absorbed by the crops moves through soils, ultimately finding its way into supplies of water.

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[96]Source 35.
[97]Source 35.
[98]Source 35.

A recent EU directive requires all member states to identify by December 1993 those areas where there is a possibility that farming may contributes to a deterioration of the water supply. Limits to farming will then be imposed on those areas over the next six years, forcing farmers to reduce their use of nitrate based fertilizers to the extent that the water meets the maximum allowable content of 50 ppm. The impact within the U.K. alone could seriously adversely impact the farming industry (mainly in East Anglia), affecting crop yields associated with over five million acres of land.[99]

In order to bring U.K. water into the acceptable levels established by the EU spending on technology and equipment through the year 2000 is expected to exceed $40 billion. A $45 billion capital investment program which includes spending on a range of equipment and services including water treatment systems, monitoring instrumentation, pumping stations, sewage treatment, water main relays and flood prevention has already been initiated. In 1992 U.K. industrial firms alone invested $677 million for equipment to control & limit their pollution. The growth in this sector is expected to increase by 10% per year during the near term. Close to 40% of all products & services invested in by U.K. firms during 1992 were imported. Chart 9 on the following page indicates how the market for such imports was shared.[100]

Not surprising, the conditions in - and challenges faced by - the U.K. are by no means exclusive to this member state. Bringing the new eastern German states into compliance with EU standards will require a substantial investment of between $60 and $87 billion over the next several years.[101] Over 7 million eastern Germans - approximately 40% of the eastern German population - consumes drinking water that does not meet EU allowable guidelines in the areas of iron, manganese, pH, nitrates, odor, turbidity, and microbiologic

[99]Source 35.
[100]Source 35.
[101]Sources 32 & 13.

agents.[102] Communities and cities within the eastern states have recently formed new water & sewerage districts and are ready to proceed with numerous projects in the areas of water purification, sewage and pipeline construction.[103] In eastern Germany alone, an estimated 150 existing water treatment plants will be retrofitted with equipment that can remove phosphates from water through biological, rather than chemical, methods.[104]

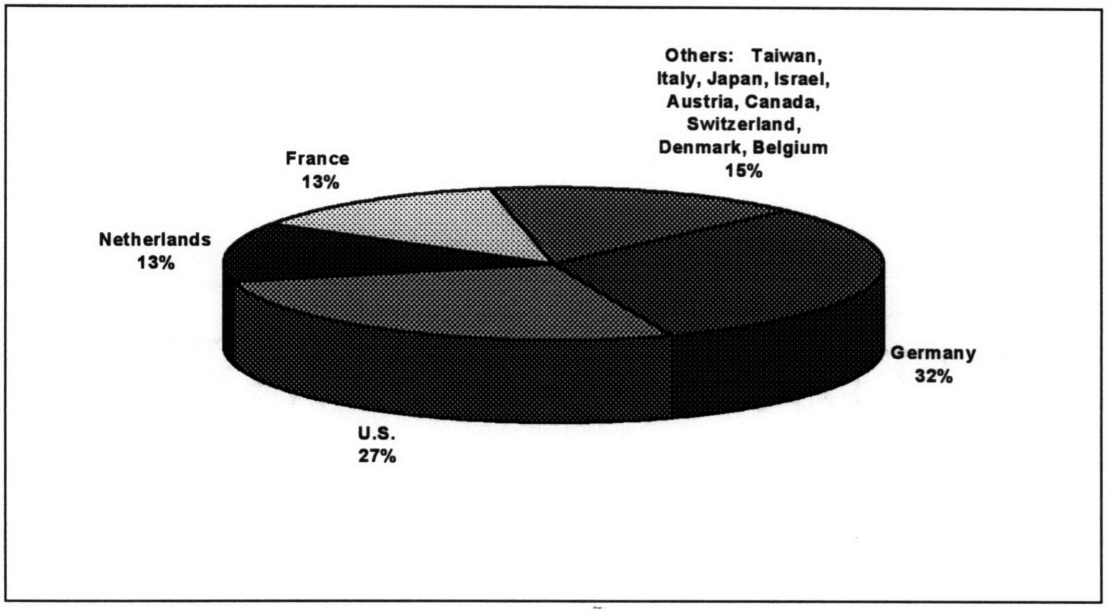

Chart 9. Countries & Their Respective Shares of the U.K.'s Water Services/Products Market, 1992

As does contaminated water pose as a genuine threat to the personal health of the members of the populace within EU countries, so does the lack of reliable supplies of fresh water pose as a threat to the economic health of EU member states. According to the Commission, the lack of fresh water will constrain or increase the cost of economic growth within the EU if current patterns of water use go unabated.[105]

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[102]Source 12.
[103]Source 32.
[104]Source 12.
[105]Source 35.

Reports released by the EU during the early 1990's indicate that while the threat is most pronounced in those EU countries that border the Mediterranean, industrial and agricultural contamination if continued at its current rate could lead to economic constraints affecting those member states lying further to the north. One report asserts that "even before assessing the costs of meeting water quality standards, EU members will have to invest heavily simply to keep water supplies available and flowing."[106]

The factors cited as contributing to the shortage of fresh water within the EU range from being quite apparent, if not predictable, to being less obvious and more subtle. Water shortages within several regions of the EU could result due to the high densities of population and industrial development, despite the presence of plentiful rivers and abundant rainfall. A significant amount of that water which is available for domestic (household) and agrarian use is lost before it ever reaches its intended destination through leakage & evaporation. Between 15 & 30 percent of the water intended for delivery in households and approximately 50 percent of the water used in irrigation systems is lost through leakage and evaporation. Increased investments in technology to prevent loss of water due to leakage and the reuse of industrial and waste waters are cited by the Commission as possible solutions to the problem of maintaining fresh water supplies that meets the demands resulting from increased growth within the economies and populations of EU member states.[107]

Of course not all hydrology-related work within the EU is focused exclusively on attempting to remedy or limit future abuses of the environment. One such example can be found in Spain, where plans are being drawn-up to create some 200 reservoirs and divert water to drought afflicted areas. The National Ministry of Public Works has not yet

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[106]Source 35.
[107]Source 35.

divulged many of the details regarding the $30 billion plan, but it appears that the scheme would involve the diversion of flows from the river Elbro to the central and southern parts of the country which are undergoing their worst droughts within this century. Notwithstanding the stiff opposition to the plan given by regional governments, who contend that they will not permit diversion until the national government builds 13 dams in their locales to distribute the water, and environmentalists, who contend that the use of extensive ground water resources has not been investigated fully, government officials are still faced with determining the means of financing the project should it go forward.[108]

It would be difficult to limit the scope of discussion within the environmental area simply to water without also addressing the efforts within the community to address the problems associated with contaminated soils. While the most visible "environmental" effort within the EU during recent years has been directed toward the remediation of and prevention of further damage to supplies of fresh water, an area that is inseperably related to fresh water which continues to receive growing attention, is that of soils.

While the extent of the problem in many member states has not yet been fully determined, recent progress within Germany in identifying the extent of soil contaminations resulting from almost forty years of occupation by Soviet forces in what was East Germany serves to illustrate the efforts taken by one member state in this growing area of concern.

The cleaning-up of the over 1,100 pieces of property in eastern Germany, with a combined area of 243,000 hectares,[109] once occupied by the Soviet armed forces will cost approximately $15 billion. Of this amount $1.25 billion will be required "immediately" to

[108]Source 75.
[109]There are 2.47 acres per hectare.

remediate the "most severe, health-threatening situations."[110] As of the Spring of 1993, some 560 properties had been inspected with a total of 15,000 potential contaminated sites identified. The greatest threat to the inhabitants of outlying areas of such sites is contaminants introduced through water supplies. It is estimated that emergency measures are required on 1,048 sites located on 263 properties throughout eastern Germany.[111]

The assessment work, whose findings are shown in Chart 10, to date has been coordinated for the German government by the German firm Industrienanlagen-Betriebsgesellschaft (IABG). The IABG has sub-contracted the site assessment work to 27 eastern German engineering firms who in turn:

1. Survey and describe contaminated properties.
2. Provide chemical analysis and cartographic recordings as report supplements.
3. Prioritize risks and assess costs for cleaning up each site.

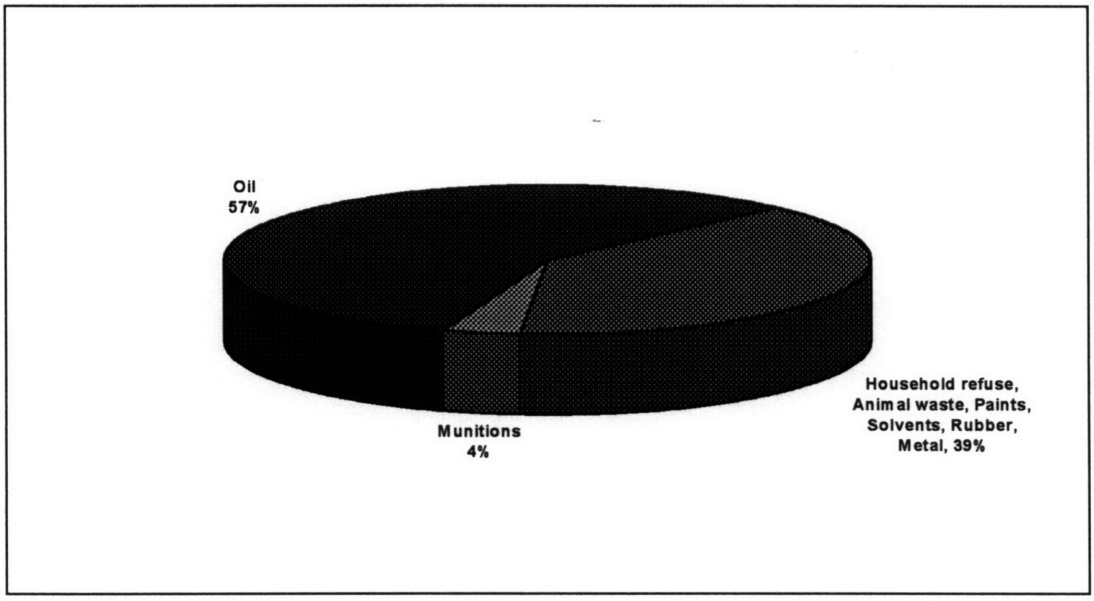

Chart 10. Sources of Contaminants to Water Supplies from Former Soviet Bases in Germany[112]

[110]Source 12.
[111]Source 12.
[112]Source 12.

Atmospheric quality has also recently surfaced as a priority for the majority of EU countries, especially those with a high concentration of heavily urbanized areas which are home to 80% of the EU's population. The U.S. Department of Commerce estimates in 1991 alone the market for industrial air pollution control equipment to have stood at $12 billion. Annual growth in the air pollution control sector is estimated at 10% which, incidentally, is the same percentage of total sales of related equipment captured by the U.S..[113]

The impetus behind much of the activity regarding atmospheric quality is due primarily to increasingly tough legislation at both the EU and individual member state levels. Commission directives already approved establish:[114]

- air quality standards for lead, nitrogen oxide and sulfur oxide
-CFC production quotas
-product quality standards (ie. lead content in gasoline)
-emission standards for vehicles and factories

The increased generation of airborne pollutants in recent years has greatly increased the market for industrial air pollution control equipment which, in late 1992, was estimated at a value of $12 billion.[115] The increased emphasis on preventive solutions as opposed to "end-of-pipe" solutions has generated a movement to service and retrofit existing manufacturing facilities with hardware that measures and limits the release of harmful particles into the environment. According to the U.S. Department of Commerce, U.S.

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[113]Source 50.

[114]Source 50

[115]According to the U.S. Department of Commerce's industrial sector analyses, French market demand in 1990 reached $370 million, Italian market demand reached $307 million and Danish market demand reached $124 million. The sector is thought to grow at a rate of approximately 10% per year. Additionally, the cost to repair atmospheric damage within the five eastern German states is estimated at $16 billion.

firms can reap prospective benefits in particular from sales in the areas of recycling equipment, sensors & analyzers and heavy metal collecting equipment.[116]

2.3 Summary

As is the case within the economies of most nations and markets of the world, the construction industry within Europe plays a significant and influential role. The European construction industry in 1991 alone generated $330 billion in revenues while employing approximately eight million people in the process. Furthermore, the professions of another thirty million people throughout Europe were directly affected by the activity within the construction sector during this period.

The Single Market's advent is being felt throughout Europe not only through the directives being passed at the Union level, which it is hoped will have a unifying effect between the individual member states, but also in the form of initiatives and actions which affect growth within the construction sector directly. These initiatives are leading to extensive opportunities for firms within the areas of infrastructure development and environmental protection & remediation. This is in part evident by the European Commission's commitment to invest $22 billion annually for the next six years on projects that lead to improvements in these two areas.

The European Commission cites four factors which influence how the Single Market-affected infrastructures, primarily transportation, is to be planned and improved; namely volume effect, dimension effect, cohesion effect and requirement for (standardized)

[116]Source 50. Additionally, the demand for catalytic converters is booming and estimated to reach 20 million by 1995. They are required on all new cars purchased within the EU beginning in 1993.

quality. The influence of these four factors is being felt as the Union grapples with the reality of merging the many diverse individual markets that are Europe.

Acting responsibly toward the environment has only recently surfaced as a concern of the Union. The issues facing Europe in cleaning up and preventing further damage to the environment appear daunting, particularly in light of the mandated standards passed to date at the Union level. Although only one case was looked at in detail here - that being the conformance of water standards in the United Kingdom to EU water standards - it serves as a fair and representative example of the challenges currently facing all member states and regions throughout the Union.

The Single Market's influence, though, is not limited merely to opportunities generated within the industry as a result of initiatives within these sectors. As will be discussed in the following chapter, the potential effects of market-related legislation on firms and the competitive nature of business can be considered far-reaching, indeed revolutionary.

3.0 The EU's Impact on the Construction Industry within Europe

The extent to which the EU impacts its individual member countries' construction industries[117] through its Single Market initiative is significant, as can be seen in the examples cited in the prior chapter. Whereas the focus of Chapter 2 was on specific opportunities arising within various sectors of the construction industry as a direct result of the launching of the market, the focus of this chapter is from a markedly different perspective.

The primary goal of Chapter 3 is to examine the impact of EU policy on what are identified here as the *construction product* and the *construction process.*[118] Policy, implemented primarily through the passage of directives and regulations, affects a myriad of areas. These areas range from the manner in which public contracts are tendered, pertaining to the process of construction, to the "proper" design of the products used within a construction project, pertaining to the product of construction. This chapter examines some of the more prominent policies being enacted by the EU that impacts both the construction product and the construction process.

In viewing the EU's impact on the industry from this perspective, it is possible to gain insight as to those factors and forces that directly affect the decisions made within firms operating within industry. It is only when viewed in this context that a solid, realistic understanding of the EU and the manner in which it affects firms operating within the industry can be obtained.

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[117]For the sake of brevity from this point forward reference to the construction industry implies reference to related industries. Related industries include architectural, engineering and waste treatment & remediation.

[118]The term "construction product" refers not only to the materials going into a construction project but the completed project itself. The term "construction process" refers to the interface between all parties that influence a construction project, either directly or indirectly.

Another area that EU policy potentially impacts the construction industry is that of research and development (R&D) and the transfer of technologies into practice. A secondary goal of this chapter is to explore the means through which R&D is pursued at the EU level and to address the extent to which current programs and policy influences the construction industry. This subject is addressed separate from that of products and processes of construction because it ultimately impacts both areas and, in so doing, should not be addressed exclusively under either heading. The chapter closes after addressing the role played by the European Construction Industry Federation on the industry's behalf in influencing the shape of construction-related policy.

This chapter provides insight into these issues, highlighting several of the more salient, themes. It is by no means intended to be an all inclusive assessment of the ways in which the EU is affecting the industry, but rather strives to serve as a summary of the more cogent, prominent ways in which its impact is felt *within the context of the Single Market initiative*. While the full impact of most measures that impact the industry is yet to be felt throughout the EU, given that most actions have either not yet been adopted at the member state level or are in various infant stages of implementation, it nonetheless is possible to draw some conclusions based on their progress to date.

3.1 The Impact of EU Policy on the Product(s) of Construction

Through the adoption of directives and regulations by the Commission, the EU is implementing policy which clearly affects the "product" of construction throughout its various member states and regions. Its impact on the product of construction is being felt not only in several overt, not-too-surprising areas, but in areas that are less obvious - yet nonetheless important - which also require attention.

Those elements of the construction product which initially come to mind, such as the standards that apply to the materials, products and codes that are brought together through the course of a project, are initially addressed followed by those elements that are less obvious, yet still relevant, to the construction product in that they potentially influence various aspects of the construction product. These less obvious areas pertain primarily to the environment and influence the construction product by affecting the production (to include composition) and subsequent handling of various forms of waste and the sources of energy used by industry.

3.1.1 Construction Products and Building Codes

According to the U.S. Department of Commerce, one-third of the roughly $500 billion turnover within the EU's construction industry - around $167 billion - during 1991 was attributed to the sale of construction products.[119] While the value assigned by the Department of Commerce to the total volume of construction activity within the EU may appear to be a liberal estimate, particularly in light of ENR's estimate of $330 billion for the same time period,[120] it nonetheless stands to reason that the market for construction products is significant and that it has a noticeable impact on what occurs within not only the construction industry, but many other industrial sectors as well. The ripple effect on other industries resulting from activity within the construction products market is significant, as can be drawn from Table 6.

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[119]Source 45.

[120]Source 43. The value of $500 is also quoted by Source 63 as being the approximate amount of turn-over annually in Europe.

Industrial Sector	Percentage of Products Used by the Construction Industry
Roof tiles and bricks	100
Ceramic tiles and sanitary ware	100
Cement	100
Plaster	97
Flat glass	70
Wood	65
Paints	40
Power cables and wires	35
Steel	30
Plastics	25

Table 6. Construction Products Impact on Upstream Industries, Europe[121]

According to the U.S. Department of Commerce, specific areas where there is a demand for imports within the EU within the construction products market are high-efficiency roofing materials, insulation, and prefabricated housing.[122]

The existence of regionalized building codes and product standards in combination with cumbersome, often protective barriers to in-bound commerce located at member states' borders, have acted to stymie the free cross-border (intra-EU member state) movement of most building materials. With the removal of existing intra-EU barriers, enabling goods to move more freely between EU member states, in addition to other measures being taken which are discussed in this chapter, a merging of what had been relatively closed construction products markets is occurring.[123] While the intra-EU movement of products thus far is most noticeable within that sector that serves the housing industry, the volume of

[121]Source 2.
[122]Source 50.
[123]Section 3.3.3 addresses the EU's customs legislation to a greater extent.

flow of products which serve other sectors of the industry is also increasing.[124] Appendix 1 contains an analysis conducted by the author in which the possible impact of Union level directives and actions, such as the CPD, on the level of competitiveness within the European construction industry is addressed.

At the core of the transformation is the construction products directive (CPD),[125] providing the framework around which construction products standards in the areas of performance and fitness will be harmonized throughout the EU.[126] It serves to both replace and build upon the existing system, the European Union of Agreement (UEATc), which consists of a series of bilateral agreements between national member bodies such as the German Institut für Bautechnik and the British Board of Agreement. Although the directive has been law throughout the EU since 1991, a fair amount of technical work remains to be completed, five years' worth by one estimate, before manufacturers will be able to certify that their products conform with the directive's provisions.[127]

The directive pertains to all materials and products to be used throughout all construction related fields. It establishes the procedures by which manufacturers may attach the CE mark, a seal which "certifies" the product as worthy for its intended use. Prior to being able to affix the CE mark manufacturers must have a registered factory production control system in place that conforms with the relevant ISO 9000 quality assurance system *in addition* to ensuring that the product meets or exceeds applicable performance and fitness

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[124]This difference is no doubt due in part to the continued growth exhibited within the housing industries of many member states, compared to moderate or reduced growth experienced in other sectors.
[125]Officially referred to as CPD--89/106/EEC.
[126]Fitness criteria include standards covering mechanical resistance and stability; safety in case of fire, hygiene, health and environment; safety in use; protection against noise; and energy economy and heat retention. These criteria are prescriptive in nature. Performance criteria take into account the expected working life of the product in addition to varying geographic/climatic conditions that the product may be subjected to. For additional information please refer to the article "A Single Market for EC Construction Products," by Mary Saunders, in Business America (25 January 1993).
[127]Source 45.

standards.[128] Product conformity certification in some cases can be administered by the manufacturer whereas in other cases, depending on the type of product, must be done by a third party. In the event that no standards - either existing or planned - are present for the product, the directive calls for the issuance of a "technical approval" (European technical approval--ETA) by the body European Organization for Technical Approvals (EOTA). Such an ETA is valid for five years and permits the manufacturer to affix the CE mark.[129]

Acquiring ISO accreditation to market construction products within Europe is, however, problematic due to the fact that there is currently no means of obtaining a single registration certificate for the entire EU. Accreditation within Europe is still granted by national accreditation bodies and none of these bodies, with the exception of the Netherlands, has accredited U.S. registrars. Some U.S. based registrars have, however, signed memoranda of understanding with European registrars which cover a variety of activities such as offering joint registration, multiple certificates or the subcontracting of audits to U.S. personnel. There are currently 45 registrars within the U.S. having registered a total of 700 companies (from all industries) in ISO 9000 since early 1993.[130]

A myriad of other actions are occurring elsewhere to assist in making the CPD's implementation a reality. The European regional standards bodies of CEN[131] and CENELEC are devising product-specific standards with the assistance of interpretive documents being developed by EU Commission staff and member-state experts. As of

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[128]Section 3.3.2 addresses ISO's impact on the process of construction.

[129]Source 45. For additional information refer to Business America, 14 June 1993.

[130]Source 46. According to Civil Engineering (Source 20), the number as of February 1994 is closer to 2,000 and appears to be growing at a rate of approximately 100 per month.

[131]CEN is the European Committee for Standardization. Refer to Section 3.3 for additional information pertaining to CEN.

early 1993 the Commission had issued 33 provisional mandates for standards to CEN and CENELEC, addressing the majority requirements stipulated in the CPD.[132]

But while significant progress has been made to make the CPD a reality, it has not been without some overshadowing disappointments. Despite the fact that CEN & CENELEC had as of early 1993 completed or initiated products standards work which addresses 75% of the CPD,[133] the directive's implementation has been slowed to at least through 1997 due to a failure to agree on the provisions contained within the interpretive documents. The most contentious issue is that of fire safety, with member states failing to agree on a common testing requirement in this area. They have, however, agreed to resolve the issue upon the completion of a research program (three to four years' duration).[134] Not only has the development of the product specific standards relevant to the CPD been slowed, but so has the granting of ETA's by the EOTA.[135] However, technical approvals issued under the older system which the CPD is replacing - the UATc - are still valid.[136]

Another function vital to the implementation of the CPD is being performed by CEN in its effort to develop regional building codes, referred to as "Eurocodes," which will harmonize the requirements for the design and construction of structures and civil works throughout the Union.[137] Several Eurocodes are slated for adoption by CEN in 1993 on a provisional standards basis (referred to as prENs), during which time national standards will continue to remain in effect. The full application of the Eurocodes will require member states to

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[132]Source 59.
[133]Source 59.
[134]Source 45.
[135]Among those products initially proposed by group members for approval are liquid waterproofing for roofs, external insulation with thick and thin rendering, systems for structural glazing, prefabricated partitions and anchor bolts for concrete.
[136]Source 45.
[137]Source 45.

replace conflicting national and local building codes with the relevant Eurocode and is projected to occur some time in 1997 or 1998.[138]

All other factors remaining fixed, the eventual standardizing of both construction products and building codes throughout the Union should enable firms who've achieved success within one member state to attempt to do the same elsewhere within the Union. This scenario, in which the easing of barriers to entry within various sectors of the construction industry are essentially reduced, will likely result in increased competitiveness within member states' markets and may lead to subsequent attempts at the member state or regional levels to impose yet more barriers. The rivalry within markets may be particularly intense along the borders of other member states, as the industry to a large extent will continue to remain local (within the housing sector in particular).

It is of interest to note that in such a scenario, those firms throughout the industry operating within markets whose national/regional standards most closely resemble those which are ultimately adopted will reap decided competitive advantages over those firms within other markets in that they will have to change the least (therefore likely invest less) in order to conform to the new standards. With this in mind, representatives of the individual national standards bodies are no doubt attempting to influence policy to favor their respective country. Barring success in influencing the standards ultimately arrived at those countries whose firms are at decided disadvantages will likely seek protection of indigenous firms through other means.

[138]Source 59.

3.1.2 A Barrier within One Nation's Construction Products Market[139]

Despite the EU's development of a common group of product standards, another "standards-related" barrier peculiar to Germany will likely continue to exist within the German market. While the *yet-existent* EU mark of conformance to construction product standards, including safety, is the CE mark, the *existing* mark of conformance to strict German safety standards is the "geprüfte Sicherheit" (GS) mark.

It should first be pointed out that possession of the GS license, authorizing the manufacturer to affix the GS mark to his products, is not mandatory for all products sold in Germany. Rather, the license is required to meet insurance eligibility requirements of those firms manufacturing products that have a direct impact on the health and welfare of individuals. *However, it is not uncommon for firms to voluntarily display the GS mark as a means of further differentiating their product, making the mark a "practical, market necessity."*[140] Products are inspected and tested for compliance with German safety standards by the framework provided by the Technischer Überwachungsverein (TÜV), the German Technical Inspection Association. The TÜV is made up of private companies set up by the various German states and has established representative offices within the U.S..

Until the exact specifications for construction products are established at the EU level, therefore requiring the use of the CE mark, the use of national marks, such as the GS mark, will continue to play a large role in the marketing selling of products. Whereas the CE mark is not considered a "consumer" mark, the GS mark on many products is and such products will likely not be competitive unless they bear the mark. According to the U.S. Department of Commerce, "German consumers will look for the mark on a product and be positively influenced by its presence." While the construction products market is not as

[139]Source 18.
[140]Source 18.

strongly influenced by the attitudes of the majority of the consumers within Germany, the conservative, quite traditional attitude possessed by this markets' consumers, in this case general contractors, will likely prevail, making the GS mark on many products a practical necessity.

3.1.3 A Selection of Environmentally Focused Legislation

An area which affects the construction "product" in what perhaps can best be described as an indirect, more covert fashion than those areas already discussed, is that of the environment. Perhaps no other subject area requiring legislative action by the EU is more fragile and sensitive than that of the environment, requiring Union officials to develop and implement policy that on one hand acts responsibly toward the environment while on the other hand acts so as not to cripple industrial output or further investment. The added dimension of national and regional industrial/economic diversity within the context of the relatively new Single Market only adds to the challenge of pursuing policies that act responsibly towards all they affect.

According to a representative of the U.S. Department of Commerce, the harmonization of member states' environmental programs has achieved success in several areas. One example of this success is seen in the auto industry, where various air and noise emissions standards pertaining to motor vehicles are now merged into one set of standards applicable throughout the EU. This harmonization allows automobile manufacturers to obtain a single "type-approval" applicable throughout the entire European market.[141]

Unfortunately the success achieved in some environmental sectors can not yet be claimed for the sector of waste. The intra-EU movement of waste is a delicate issue and currently

[141]Source 51.

has a directive pending resolution. Although waste is by strict definition recognized as a "good," most administrators admit that its true status is that of a "special good" and are, understandably so, reluctant to import it. Administrators seek to balance the concerns of those who may appear likely candidates for receiving imported waste, those representing the "not in my backyard" contingent, with the delicate issue of keeping the movement of the waste to a minimum under the "proximity principle."[142]

A proposal adopted by the European Commission in February 1994 underscores the problematic web of issues and interests that often invariably entangles environmental-related legislation. The adopted proposal would promote the use of motor fuels derived from agricultural crops by establishing a preferential tax system for alternative fuels such as methanol, bioethanol and vegetable oils which, at current costs, are far more expensive than conventional fuels. But the proposal was not backed by all members of the Commission. Whereas the plan's proponents claimed that the use of so-called biofuels would not only cut smog and carbon monoxide pollution, but that it would additionally reduce the EU's dependency on imported oil and help to stem the loss of farm jobs, the plan's adversaries questioned the plan's environmental "credentials," claiming that "biofuels would increase other forms of air pollution and compound water pollution caused by fertilizers." The adversaries further asserted that the plan amounted to a subsidy to farmers.[143] It would be difficult in such a scenario to claim that either side's argument is clearly right or clearly wrong, as there is an element of truth in both arguments. As this example shows, the development of responsible, effective policy is problematic because of the many interests - political and otherwise - involved.

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[142]Source 51.
[143]Source 53.

Whereas general success has been achieved through the successful at harmonization of environmental legislation at the EU level - and progress continues to be made on unresolved issues - failure appears to exist at that level which really makes a difference: the member state level of implementation. Perhaps in no other area is this more apparent than in that of water standards. Despite having achieved uniformity throughout the EU in establishing standards which control the discharge of dangerous waste and substances into water, almost all member states have nonetheless been taken to the EU Court of Justice for non-compliance with EU standards.[144]

In achieving compliance at the member state level, EU planners acknowledge the need to monitor national enforcement of environmental legislation more closely but are also aware of the power of positively reinforcing the behavior of those who act in an environmentally responsible manner. With this in mind they have devised three initiatives; namely an energy tax on carbon dioxide (CO2) emissions, the Eco-label program and the Eco-audit program. A fourth measure, the imposition of packaging waste controls, relies more on the premise that industry should shoulder a larger portion of the responsibility for the waste generated from their products, and seeks compliance through legal standards rather than through the use of a market related incentive. These four measures are highlighted in the following four sections.

3.1.3.1 The Packaging & Packaging Waste Directive (proposed)

The intent of this directive is to harmonize European packaging standards and related symbols in order to facilitate the free flow of goods within the Union while simultaneously maximizing the environmental benefits offered by the various national waste management systems. The directive seeks to attain these objectives by establishing (1) recovery and

[144]Source 51. Please refer to Section 2.2 for further information about one member state's attempt to comply with EU standards.

recycling targets (2) essential requirements and conformity symbols for all packaging and (3) broad criteria for member state waste management systems.[145]

The proposal mandates that within 10 years of the directive's passage, member states must recover 90% by weight of their packaging waste through recycling, composting and incineration (to produce energy). Furthermore, no more than 30% of each packaging waste material could be incinerated and 60% of the recovered materials would have to be recycled. Mandatory markings will have to be displayed indicating the reusability or recyclability of the packaging, whereas voluntary markings could be used by the manufacturer indicating the source of the packaging (ie. recycled materials).[146]

With such measures being considered, one might think that Europe lags behind the U.S. and Japan in terms of both recycling efforts and in limiting the amount of garbage produced by its populace; this, however, is not the case. In a report released by the Union's official statistics agency, Eurostat, it was revealed that the annual per capita amount of trash produced in Europe is less than half of that in the U.S. and just over two-thirds of that produced in Japan (see Chart 11 on the following page). With recycling practices throughout Europe on the increase, Eurostat further determined that 40% of all glass, cardboard and paper refuse is recycled, as opposed to in U.S., where 30% of the paper and cardboard and 20% of the glass is recycled.

Although the proposed packaging and waste directive states that "these waste management systems shall ensure the coverage of imported products under non-discriminatory conditions and shall be designed in such a way that there are no barriers to trade or distortion of competition," foreign firms desiring to export to countries within the EU have

[145]Source 51.
[146]Sources 51 & 60.

reason to be alarmed. Exporters' opportunities within a member state's market could be severely hampered by having their applications held up at the *national level*, either through reduced access to the system's bureaucratic process or through undergoing a more thorough scrutiny, resulting in a substantial loss of market share.[147]

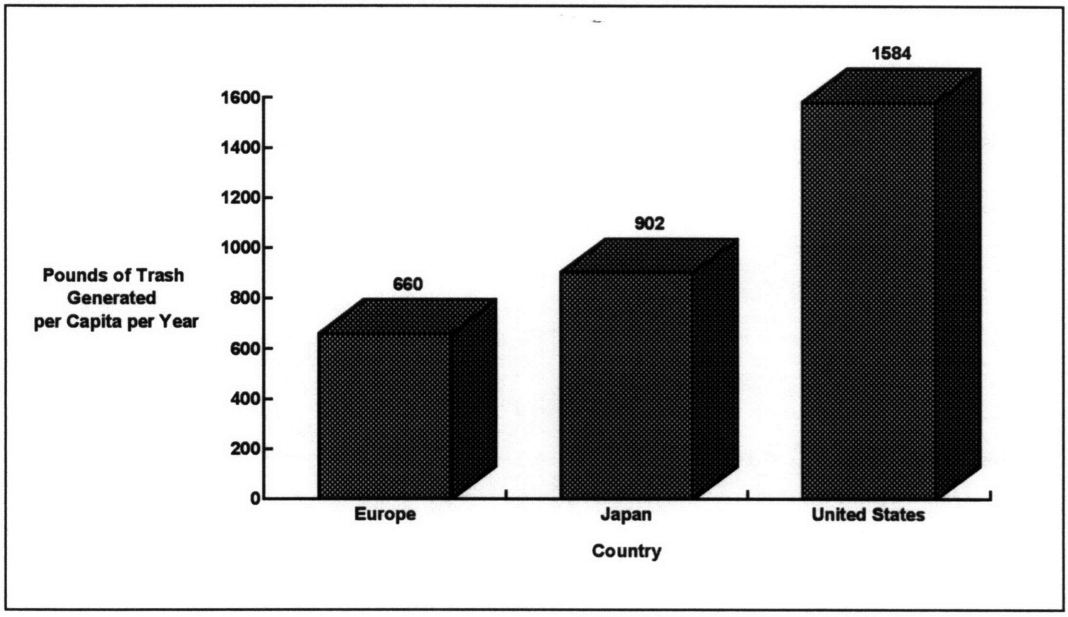

Chart 11. Pounds of Trash Generated Annually per Capita for Selected Areas/Countries[148]

Other complications arising from the proposed directive stem from the targets specified in the directive. Firms point out that the targets, particularly those related to incineration, incorrectly assume that recycling is always the preferred method of recovery. Critics contend that an oversupply of recyclable materials, which in turn will affect the availability and price of recyclable materials, will be the likely result of such a policy. Other possible results are that packaging technologies will "freeze" at their current levels, leading to a stunting of innovation that could ultimately stymie the development of more environmentally friendly packaging methods.[149]

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[147]Source 51.
[148]Source 65.
[149]Source 51.

Critics of the directive also point out that a similar system, such as that already in place in Germany, has led to dumping in neighboring member states. Amid these accusations a compromise offered in December 1993, which would "let wildly varying national policies converge gradually," will likely result in changes to the established targets once implementation of the law is reached. These changes would lower the amount recovered from 90% to between 50% and 60% and the amount recycled from 60% to between 25% and 45%. The compromise allows poorer countries, such as Greece, Ireland and Portugal more time to implement the law and wealthier countries, such as Germany, Denmark and the Netherlands to retain their more stringent goals.[150]

At the time of this thesis' writing, the Commission was considering a draft amended proposal of the packaging waste directive which rejects the polluter pays principle from being applied to imported packaging.[151] Additionally, the EU's research ministers had cleared the proposal keeping it largely intact, except for a reduction from 60% to 50% in the requirement which specifies the quantity of waste to be recycled. The proposal must now be ratified by the European Parliament- where opposition is expected - prior to becoming a law.[152]

3.1.3.2 The Energy Tax (proposed)

The energy tax proposed by the Commission is intended to reduce CO2 emissions by acting as an incentive to "steer users away from higher polluting fuels." The "incentive" stems from a tax that initially would be established at $3/barrel of oil and would increase at a fixed rate until reaching $10/barrel by the year 2000. The tax is intended to be fiscally neutral and would be based on (1) the energy component applicable on a uniform basis to

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[150]Sources 60 and 63.
[151]Source 73.
[152]Source 63.

all energy sources *except* renewable energy and (2) the C02 component which would reflect the carbon content of the fuel. International trade and competition distortions by those industries that are energy intensive would be avoided by exempting such industries until other countries, primarily the U.S. and Japan, adopt a similar tax.[153]

3.1.3.3 The Eco-label Program

As mentioned earlier, the Eco-label program qualifies firms to affix special labels to those products which are environmentally benign, in hopes that consumers will respond by purchasing such products. The regulation governing the program calls for the establishment of principles and criteria for various product groups. Additionally, it discusses broad guidelines for national fee structures while allowing member states to act according to their discretion. The program applies a "cradle to grave" approach in evaluating the worthiness of a product to display the label, taking into account the pollution resulting from the various stages involved in the creation and life of the product.[154] Although the Union has approved the program, products with the label are not yet found, as the criteria for each product group are not yet fully developed.[155]

3.1.3.4 The Eco-audit Program (proposed)

The Eco-audit program is similar to that of the Eco-label in that those firms in compliance with the established standards would receive recognition *for the environmental performance of each manufacturing site.* The program is currently being blocked by one EU member state who contends that the issue is a national one and not one for consideration at the Union level.[156]

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[153]Source 51.
[154]Pre-manufacturing, manufacturing, distribution, life and disposal.
[155]Source 51.
[156]Source 51.

3.1.3.5 A Glimpse into the Future

The Commission's fifth environmental action program, entitled "Towards Sustainability," outlines the EU's strategy concerning the environment for the next decade. It establishes quantified goals in addition to stating the measures that can be taken in order to achieve them. A hint at the course which future legislation, programs and policy in general, will take can be gathered from the following tenants embodied in the program:[157]

- Greater consultation and cooperation between industry, labor, consumers and government;
- Added emphasis to burden sharing as opposed to simply regulating;
- Greater use of fiscal and economic instruments to help reconcile market forces and environmental objectives by internalizing costs within the price of products, enabling environmentally-friendly products to gain a competitive advantage.[158]

The prospects for the Commission being able to realize its environmental-related goals over the next decade are mixed, due in large part to the strains felt by member states. The greener members of the EU continue to become increasingly disappointed with the lack of significant progress in and enforcement of EU environmental legislation, while the poorer EU members, being poor and being green are practically mutually exclusive, are equally frustrated over the lack of available resources to address ecological issues. *This state creates pressure on the Commission to shift environmental responsibilities back to the member state level.* If this occurs, a return to divergent member state environmental policies is likely, which in turn would "act to reduce or eliminate gains made by the EU in terms of bringing down trade barriers ensuing from diverging environmental rules and

[157]Source 43.

[158]This departs from the "polluter pays principle" which critics claim does not force the product's end user to shoulder enough of the responsibility.

related benefits gained by both the environmental community and industry."[159] These strains will only become accentuated as richer and greener Scandinavian countries become members of the EU and as eastern European nations with more serious environmental problems move yet closer to attaining EU membership.[160]

Table 7 shows the planned dates of implementation for environmental legislation passed as of March 1993.[161]

Area/Topic	Implementation Date
Sound levels for motorcycles	10/89
Noise levels for appliances	12/89
Air quality standards	1/91
Lawn mower noise levels	7/91
Handling of genetically modified organisms	10/91
Batteries	9/92
Eco-Label program	10/92
Freedom of access to information on the environment	12/92
Air pollution from motor vehicles	1/93
Waste water treatment	7/93
Water pollution from nitrates	12/93
Hazardous waste	12/93
Labeling for energy efficiency/appliances	1/94
Labeling for energy efficiency/water heaters	1/94
Movement of waste	6/94
Packaging and packaging waste	Proposal
Liability for damage caused by waste	Proposal
Landfills	Proposal
Incineration of hazardous waste	Proposal
Eco-Audit program	Proposal

Table 7. Environmental Legislation Status as of March 1993

[159]Source 51.
[160]Source 51.
[161]Source 51.

3.2 The Impact of the EU on the Process of Construction

The impact of EU policy is just as pronounced on the process of construction as it is on the product of construction. As is the case with policy affecting the construction product, policy directed toward the construction process is implemented with the broader intent of reducing cross-border barriers to free trade and commerce.

Seen as essential to reducing the cross-border barriers to trade within the construction sector is the implementation of policy that affects the construction process both directly and indirectly. Much of this policy developed ultimately affects the manner in which contracts are tendered and awarded, directed at effecting change at the member state level which encourages the intra-EU movement of construction activity.

The conditions contained within the existing, pre-Single Market procedures covering the tendering and award of contracts at the member state level vary drastically and serve to block the cross border flow of commerce. It is no secret that such procedures in many cases serve to ensure that construction projects contribute directly to the local economy and those firms within it; resulting in discrimination against non-indigenous firms. By effectively reducing the pool of available contractors through such procedures, a system which in essence subsidizes indigenous businesses, the client[162] often limits itself by selecting a contractor who is either incapable of - or not willing to - providing as much value in the completed project as one from elsewhere. While such procedures ensure that local businesses from a distinct sector of the economy profit during the short run, the longer run impact can adversely affect a much broader scope of the economy in the form of delivered project with less value and in the stymieing of intra-EU economic growth.

[162]In this case a public agency.

It is exactly this kind of condition that the framers of the Single Internal market desired to reverse. By creating policy that serves to "unleash" the competitive forces of the free market it is believed that not only will benefit be derived through the delivery projects with greater value, but through the increase in the flow of commerce across member state borders.

Areas in which current or pending Single Market related policy will have a marked impact on the construction process vary greatly and will no doubt in the future increase in number. This section addresses those areas that appear to have the greatest impact on the industry at the Union level. Topics addressed in this section include the tendering and award of contracts; the adoption of certified quality assurance systems within construction firms; the harmonization of member states' custom's legislation; the adoption of a new system for handling value added taxes (VAT); the harmonization of intellectual property rights and the financial implications for firms resulting from the unification and integration of Europe's financial markets.

3.2.1 The Tendering and the Award of Contracts

The laws affecting most stages of construction procurement within EU member states are undergoing change due to legislation enacted at the Union level. Changes to the laws affect not only *the manner* in which public projects within most sectors are advertised, but *who* will actually be permitted to bid for such projects. As such, an increasing amount of policy focused on standardizing the pre qualification conditions of construction companies is being implemented throughout the EU.

The utilities directive contains pre qualification-related provisions that enable authorities to discriminate against bids submitted by firms from countries outside of the EU by allowing them to exclude all bids that contain less than 50% EU value. An additional barrier to non-

EU firms found in the directive enables authorities to give those bids with 50% or more EU value a 3% price preference. These provisions could prove disastrous to foreign firms vying for projects or attempting to penetrate the market single-handedly, as an attempt to fend off the possible loss of a bid due to the 3% price preference feature alone could effectively reduce the project's profit potential to zero (or below). U.S. trade negotiators working on the General Agreement on Tariffs and Trade (GATT) have attempted to have these features covered under the GATT's government procurement code, thereby reducing the provisions' impact as trade barriers.[163]

The new rules also cast doubt on the legality of term contracts, a method which has been used to a large extent by many of the public agencies within EU member states. Under a term contract, contractors are hired for *works programs* instead of for *specific items of work*. According to Mark Lane, partner of Masons Solicitors, London, "a utility in that position will have to find a way out," but that EU law "can't be ignored."[164] According to Tito Manlio, secretary general of Italy's Instituto Grandi Infrastrutture, it may be four to five years before the barriers are actually removed because of the slowing/stymieing effects on implementation resulting from the forces of bureaucracy and nationalism. It is estimated that within Italy alone, 60% of eligible projects are not yet advertised within the EU.[165]

The recourse available to those firms that feel they have not been afforded the full benefits of the new EU law, although having limited teeth, is found by taking the issue to either the national government or the EU. Those that elect to go to the EU will have their case decided on by the European Court of Justice. As of early 1993 only 25 public procurement

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[163]Source 56.
[164]Source 56.
[165]Source 41.

cases had reached the court, the most celebrated case being that of Denmark's Great Belt West Bridge after complaints arising in late 1989. In December 1992 the court found the client, Great Belt Ltd. (GBL), guilty of two EU law breaches. GBL's specification of maximum *Danish* content, in addition to it having negotiated on essential elements of the contract which subsequently led to a change in the contract's price, are not permitted under EU law. Unfortunately for the aggrieved contractor, the European Court of Justice is unable to impose direct sanctions on the offender or Danish government, but rather can only "condemn" the acts as breaches of EU law.[166]

One significant change, found within the utilities directive, requires EU member state public authorities within the sectors of transport, water, telecommunications and energy to advertise throughout the EU all public works contracts valued at $6 million and above. Additionally, all public design projects valued at $244,000 and above must also be advertised throughout the Union.[167] While the full impact of this legislation is yet to be seen, it is possible to say that many parties will benefit from the legislation.

Notwithstanding protective legislation or exploitable loopholes left in place at the national level, the legislation will serve as an impetus to an increase in the intra-EU movement of construction firms. Clients can reap the benefits afforded by this increased movement by being able to select from a wider range of proposed bids, in both content and price, and the industry can benefit in that the steeper competition for such projects should contribute to a "product" or a service of greater quality and/or value. It should be mentioned that only through the enactment of other legislation at the EU level, such as the deregulation and merging of the financial services sector and the removal trade restrictive barriers at intra-EU borders can the full benefit of this legislation be derived.

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[166]Source 41.
[167]Sources 41 & 49.

3.2.2 Adoption of Certified Quality Systems within Firms

As addressed in Section 3.1.1 of this report, the adoptance of ISO standards is clearly impacting firms engaged in the manufacturing of construction products. As this section will address, these same standards are having an equally significant impact on the construction process itself.

The publication of the International Quality Standards ISO 9000 to 9004 and the European Standards EN 29000 to 29004 (identical to the ISO publication) in 1987 have since served to standardize the conditions firms throughout the EU must meet in ensuring effective quality assurance programs are in place throughout their organizations. Conformance to these standards have received wide-spread acceptance throughout the EU and are playing an ever-increasingly critical role in the minds of clients seeking to do business within a wide range of economic sectors. Achieving conformance to such standards has become practically a pre-condition to conducting business within the building industry.

Worldwide, some 40,000 firms have become registered, with 20,000 being located in Europe and 2,000 being located in the U.S..[168] These figures represent total ISO registration, spanning various sectors of the economy. According to Civil Engineering, only a "handful" of these firms are engineering related in their focus.[169] As more member states throughout the EU implement policies that act to standardize the pre qualification conditions of construction firms, so are more firms discovering the necessity of having certified "quality systems" in place within their organization if they desire to compete for projects.[170] Many U.S. firms, including Brown & Root, Houston, Stone & Webster, Inc. and Lester B. Knight and Associates, Inc., have found ISO registration to be not only a

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[168]Sources 20 & 39. Firms from 56 different countries have become ISO registered.
[169]Source 20. The U.S. departments of Energy and Defense, the GSA and NASA are considering to use or already using ISO 9000 applications in "regulatory and procurement practices," according to Civil Engineering.
[170]Source 14.

prerequisite for conducting international work but a way "to capture the best practice in all...procedures" and to convey this to a client. This trend appears to be not limited only to Europe, as other markets around the globe are moving in the same direction.[171]

While many managers have initially sought ISO registration as a means of assisting their firms in penetrating European markets, they have since discovered that becoming ISO registered has benefited their firms in other areas as well. The registration-related requirement that firms document all stages of their processes and, furthermore, that they maintain conformance to what they have documented, has led to the discovery of "instances of chronic waste from procedures that rarely get questioned."[172] Such discoveries often lead to a reassessment of internal procedures within the firm and, in many instances, more efficient operations.[173]

As one might expect, the feedback regarding the benefits accorded to firms achieving ISO registration is not all positive. Managers from several firms have found the process both time consuming and costly, especially in light of the fact that the registration process primarily entails documenting "that which you are already doing." Others worry that conforming to ISO standards could lead to a "locking-in of the status quo," since the ISO approach relies heavily on conformance to documented procedures. Others yet criticize the ISO on the basis that the initial impetus for the standards were European companies who, they contend, saw the standards as a non-tariff barrier to imports.[174]

The feedback from U.S. firms, though, has for the most part been quite positive. A recent, rather exhaustive survey of U.S.-based ISO registered firms revealed that 50% of the

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[171]Source 20.
[172]Source 39.
[173]Source 20.
[174]Source 39.

respondents felt they would recoup registration related costs, averaging between $12,500 & $50,000 for smaller firms and upwards of $300,000 for larger firms, within 3 years and that 30% felt costs would be recouped within 1 year.[175] Respondents of the survey additionally provide insight to the benefits they felt ISO registration gave their firms. These benefits, broken down by size of firm, are summarized in Table 8.

	External Benefits		
Annual Sales (in millions):	**$50 or Less**	**$51 to $500**	**$500 (+)**
Higher perceived quality	28%	34%	28%
Improved customer satisfaction	24	22	23
Competitive Edge	24	23	23

	Internal Benefits		
Annual Sales (in millions):	**$50 or Less**	**$51 to $500**	**$500 (+)**
Better documentation	28%	29%	33%
Greater quality awareness	30	29	24
Positive cultural change	12	15	14

Table 8. Percentage of 1,240 Responses from 620 Companies who Ranked the Listed Benefits either No. 1 or No. 2 Among a list of Six Benefits from ISO 9000 [176]

Regardless of what critics of the ISO claim, none of what they say serves to change the reality that being ISO registered is playing an ever increasingly important role to a firm's competitive posture within the EU.

[175]Source 39. Costs for smaller firms average vary between $12,500 and $50,000 whereas cost for much larger firms can amount to upwards of $300,000. Approximately 20% of the firms surveyed see the pay back period as 10 years or longer.

[176]Origin of the data used in this chart is from Quality Systems Update, Deloitte & Touche, and was found in Source 39.

3.2.3 The Harmonization of Member States' Custom's Legislation

In its current state as a single market, the EU is considered a fully "operable customs union." As such, the Union has a common tariff structure along with common regulations concerning areas such as the value added tax (VAT) system, temporary imports, rules of origin and the inward processing of goods.[177] Recently implemented changes in policy concerning these areas are drastically changing the manner in which intra-EU business can be conducted. There is, however, some uncertainty remaining, particularly in those areas that have not had a prescribed EU-common standard imposed at the member state level.

As of 1 January 1994 a common customs code has applied to the member states within the EU. This code essentially incorporates EU level customs legislation into a single body of rules, serving as a framework for trade with third countries such as the U.S.. As a result, the wide expanse of EU-level legislation in the form of regulations has now been rolled into one code. Member states are now in the process of transitioning over to applying the EU customs rule on imported products in a uniform manner throughout the Union.[178] The U.S. Department of Commerce has expressed concern that the uniting of customs officials across the EU through this one code may result in decisions being made in one member state regarding tariff classifications or related issues becoming binding throughout the entire Union. They fear that "inaccurate or erroneous customs decisions made in one member state could be applied by customs officers in the other eleven EU markets to the detriment of an American exporter."

One of the most visible changes is the elimination of all customs officers at intra-EU borders. This change, coupled with the deregulation of the EU's transportation industry, enables trucks to cross borders without undergoing time consuming customs checks. As

[177]Source 33.
[178]Source 33.

was anticipated by market planners, this has not only permitted a greater flow of goods throughout the EU but has improved the competitiveness of many firms serving customers in other member states.[179] Rates on goods entering the EU from the U.S. are applied uniformly by all 12 member states and fall within the range of 5 and 17 percent. Upon having been assessed duties at the port of entry, goods are considered to be in "free circulation" and may move to other destinations within the Union.

One area that is still a cause for uncertainty[180] concerns how the new regulations on essential health and safety requirements for products will be enforced at the member state level. The northern EU member states, such as Germany, generally conduct such product checks within their own internal markets, whereas the southern member states, such as Spain and Italy, conduct such checks at points of entry along their borders. It would therefore be possible for an item that was cleared by a check conducted within a northern country to subsequently be rejected in a check conducted within a southern country under the new essential health and safety requirements.

Recent changes in policy affecting the way VAT's are levied and collected is also affecting the manner of intra-EU business. The wide differences in how VAT's were assessed prompted the Commission to, in addition to other things, establish a Union-wide VAT rate. Although all member states in 1992 agreed to set the standard minimum VAT at 15% , as of June 1993 only three countries - Germany, Luxembourg and Spain - had done so.[181] Prior to the adoption of the new policy in 1992, VAT's were assessed on the purchaser of products by customs officers at intra-EU border posts. The new policy, not to be implemented until 1 January 1997,[182] not only places the payment of the VAT on the

[179]Source 33.
[180]This cause of uncertainty equally concerns both European and American businesses.
[181]Source 33.
[182]At this time the correction of imbalances and the issuance of rebates will be made by a Union-level clearinghouse.

shoulders of the producer but additionally places the responsibility of collecting the VAT on the shoulders of the member state within which the product was produced. Until this time, however, the EU has adopted a system whereby VAT's will continue to be collected in the country of destination.[183]

3.2.4 The Liberalization of the Financial Services Markets

The integration and unification of financial services, which includes the banking, securities, and insurance sectors, throughout the EU is considered to be a fundamental requirement to ensuring the success of the Single Market. The market is seen as benefiting not only from the intra-market economic growth resulting from this liberalization of financial services markets but also from the increase in competitiveness of European firms - indeed the Single Market itself - on a global scale. Providing additional impetus to the liberalization of the financial services markets is the goal of one day[184] establishing the Economic and Monetary Union, the cornerstone of which would be the integrating all of Union currencies into one unit. While this integration is not directed toward assisting any one exclusive economic sector, the benefits it affords the construction industry are very real and need to be addressed.

In a report published for the Commission known as the Cecchini Report, the gains anticipated by such a liberalization would amount to approximately $26.4 billion, adding 1.5% to the EU's GDP and reducing average prices by 1.4% over a three to five year period. The economic expansion portended by this report would no doubt enable the construction industry to benefit from this growth. In light of the liberalization's effect on the EU's GDP, it is no wonder that the Commission has adopted more than 20 directives to

[183]Source 33.
[184]This is currently planned to occur late in this decade. Source 48.

date with the intent of making the integration and unification of this critical sector a reality.[185]

The financial services markets primarily affected by the legislation are those of banking, insurance and investment services. The legislation integrating the banking markets went into effect on 1 January 1993, whereas the legislation integrating the insurance and investment services markets are scheduled to go into effect some time during 1994 or 1995.

Key to the integration and unification of these financial markets is the establishment of what is referred to as the "passport license," a condition that allows an entity authorized in one member state to open branch offices and conduct business within other member states. As a result, banking, insurance and investment institutions will be able to establish branches in other member states without having to meet separate member state legal requirements. "Host" countries must honor "home" country authorizations and are not permitted to apply separate banking rules. Provisions covered by the EU's financial services laws also extend this privilege to all like institutions within EFTA.[186]

The ability of firms engaged in business within the financial sector of one member state to now conduct business within other member states is viewed by many as vital to the Union-wide, cross border, economic growth and expansion striven for by the Single Market. Barring restrictive legislation at the EU level, it is anticipated that a greater number of financial institutions will be able to employ new strategies which enable them to not only raise and commit funds toward a project, but to reduce the cost of those funds in the

[185]Source 48.

[186]EFTA, the European Free Trade Association, is composed of Austria, Finland, Iceland, Norway, Sweden, Switzerland and Liechtenstein. For additional information on EFTA please refer to Chapter 1 of this report.

process.[187] The free(er) market's competitive forces will act to fuel this process, as those financial institutions that are unable to keep in step with competitors offering more attractive means to either finance, insure or bond construction firms and their projects fall to the wayside. These factors will no doubt contribute to increasing the competitiveness of European construction firms within other global markets as well.

3.2.5 The Harmonization of Intellectual Property Rights

An essential ingredient to the production and subsequent movement of goods throughout the single market area is an individual property rights policy/framework that is consistent and fair not only between individual member states, but between the EU and other economic markets throughout the world. Existing policy within the EU indicates that much progress still needs to be made if the intellectual property rights of businesses are to be fully protected to the extent that they are in other western markets.

Intellectual property rights (IPR) was addressed by the Commission in the White Paper (1985) and has since received increasingly wide-spread attention. The report pointed out that differences between member states' intellectual property laws negatively impacted intra-Union trade and the ability of firms to treat and work within the EU as a single market. Those initiatives that the EU has taken since release of the White Paper indicate that *public access to technology is favored over intellectual property rights of private bodies.*

In the areas of patents and trademarks, for example, although the EU has issued detailed proposals for EU-wide protection which in turn would act to "harmonize the level of protection and centralize the application procedure," neither proposal has yet been adopted

[187]The lowering of the cost of capital--and therefore the costs associated with performing a project--may be achieved through any number of means available to financial institutions.

largely for political reasons.[188] In the area of copyright protection there appears to be an ongoing "dilution of traditional copyright protection."[189] A growing number of member states have even gone so far as to create new rights and new classes of right holders which, they assert, are not covered by international copyright disciplines. This situation allows them - the new classes of rights holders - to "profit unfairly from the dissemination of copyrighted works."[190]

Although the failure of the EU and its individual member states to establish fair and consistent intellectual property laws is most apparent in the areas of telecommunications and computer software, the lack of fair and consistent laws would likely similarly affect the introduction of new technologies within many others industries, to include that of construction. Firms in possession of new technologies, which could serve to improve the processes (and products) of construction, would be reluctant to use these technologies abroad if they felt unprotected. This situation in turn could result in less intra-EU "cross fertilization" of commerce (in this case building-related commerce), ultimately restricting not only economic growth, but the level of quality or value obtained/achieved by a project.

3.3 The EU's Role in R&D and the Transfer of Technology into Practice

The EU seeks to benefit in several areas through the implementation of its Framework Program, the umbrella under which many of the research and development (R&D) activities of the public institutions are coalesced with those of academia and industry across the entire EU. An understanding of the program and, perhaps more importantly, its priorities and the roles taken by those involved and active in it, is not only revealing but

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[188]Source 38.
[189]Source 38.
[190]Source 38.

extremely relevant to the advent of the EU's Single Market. The involvement of the construction industry within EU sponsored R&D programs is extremely low, especially when one considers the importance of the role played by the industry in enabling the EU to achieve its fundamental goals contained within its Single Market initiative.

This section first takes a comparative look at the EU's recent and current attitude toward R&D and its role regarding industry competitiveness and then takes a closer look at the Framework Program itself, addressing its and the priorities embodied therein. A close look at the effort within the Framework Program which most directly affects the construction industry, known as the Basic Research in Industrial Technologies for Europe and the European Research on Advanced Materials Program, or BRITE/EURAM, is then taken prior to looking at two other relevant programs, the DRIVE Program and the THERMIE Program.[191] A discussion of the other major R&D initiative that impacts the EU on a scale comparable to that of the Framework Program, the non-EU driven program known as EUREKA, then takes place followed by comments concerning the effectiveness of European R&D policy to date.

3.3.1 The EU's Recent & Current Status in R&D

A comparative look between the 12 countries which make up the EU, the U.S. and Japan of those areas used to gauge R&D effort reveals mixed results in most areas. The EU spends a proportionately lower amount of its GDP on research, 2%, than does the U.S., at 2.8%, or Japan, at 2.9%. In terms of quantity of researchers Europe lags behind the U.S. with 580,000 compared to 950,000, whereas Japan lags yet further behind with 435,000. Although the American researchers still tend to set the pace within most fields, Europe's researchers are anything but inactive, having generated three times the number of scientific

[191]DRIVE stands for Dedicated Road Infrastructure for Vehicle Safety in Europe and THERMIE stands for Energy Technology for our Environment (English was not the language used when arriving at the acronym).

publications than have the researchers within Japan. When one compares the number of Nobel prizes awarded to individuals within each country between the years 1940 and 1990, Europe weighs-in directly between the U.S. and Japan with a total of 86 awards compared to the U.S. (143 awards) and Japan (five awards).[192] Despite basic science in Europe remaining fairly strong into the 1990's, it should be mentioned that the number of Nobel laureates has fallen steadily since the 1960's.

From a historical standpoint, events since the Second World War have shown that U.S. and Japanese firms tend to be better at using the "fruits borne by scientific research" to their advantage. This appears, in part, due to the fact that they tend to be more closely bonded to their research institutions than do the firms within Europe. This difference is perhaps best summarized in the words of Carlo Rubbia, head of CERN,[193] when he stated "In America, science is business; in Europe it (science) is still seen as culture."[194]

The realization of by the EU in the early 1980's that Europe was falling behind the U.S. and Japan in key technology-based areas and that this would lead to lost opportunities within markets of the emerging economies of South Korea, Taiwan and Singapore ultimately provided the catalyst to apply a structured, combined-effort approach to R&D at the Union level. The resulting effort, spanning an array of fields and disciplines, was launched in 1984 under the heading of the Framework Program. The common goals of the program are:[195]

- To ensure that Europe has home-grown expertise in primary areas of technology, especially in the area of clean manufacturing techniques. EU trade theorists fear that

[192]Source 68.
[193]CERN is a multi-national, but not EU-inspired, particle physics laboratory near Geneva, Switzerland.
[194]Source 68.
[195]Source 68.

U.S. and Japanese firms might corner these technologies and withhold them from European firms.

- To enable European companies to reap economies of scale in R&D. By promoting pre-competitive research focused programs the results of such research can be shared without swapping trade secrets.
- To spread ideas across intra-EU borders by financing the exchange of scientists. This also serves to preclude the duplication of effort.
- To narrow technological gaps existing within the EU.[196]

Additional useful insight to the Framework Program is found in the Single Act of 1987, which states that as a matter of policy that "the Community's aim shall be to strengthen the scientific and technological basis for European industry and to encourage it to become more competitive at the international level."[197] For the first time, the Single Act establishes clear links between EU R&D, the establishment of the Single Market and the implementation of trade and competitiveness-related Union policies. Deemed as a factor "critical for European economic growth" is the cooperation between European countries in science and technology.[198]

3.3.2 The Framework Program

An average of approximately $1.5 to $2 billion in funds is provided by the EU to technologically advanced activities and industries through the Framework Program. The program is implemented in over-lapping three to five year segments, allowing "rolling program planning," resulting in smoother transitions between individual programs.[199]

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[196]Note: in 1989 Germany spent 2.9% of its GDP on R&D whereas Greece spent only .4%.
[197]Source 79.
[198]Source 79.
[199]Source 22.

The program is quite rigidly structured when compared to similar programs in existence around the world. It is sub-divided into several industry specific individual programs, each run by the Commission on the basis of a strategic program plan. Strategic program plans are developed for each separate initiative through a complex and involved process of consultation between the Commission and the concerned industries. Prospective research consortia then competitively bid for funding to conduct research within the plans broad outline. The chosen consortia then signs a standard contract which contains the promise "to share technology beyond the boundaries of the consortium itself." Once having been awarded a contract, the Commission relies mainly on consortium members to keep each other "on-line" but does monitor the implementation of the contract to some extent.[200]

Anyone within the Commission can submit a project for support under the Framework Program as long as the proposed project involves a consortia of partners from at least two EU countries. Funds provided by the EU typically cover 50% of the total costs with only 15% of the total Framework budget being directed to small & medium sized enterprises.[201] The EU's Committee on Scientific and Technical Research (CREST) advises the Commission in R&D related areas and advises the Council on R&D related proposals forwarded by the Commission.[202]

To date, three individual Framework programs have been implemented (see Table 9). The priorities of the programs have shifted significantly over time, as evidenced by the area of energy related R&D which, during the period 1984-1987 occupied a full 50% of the spending, having been halved since the first program's implementation. Other areas within the Framework Program displaying significant changes in funding between the first and

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[200]Source 22.
[201]Source 80.
[202]CREST is a standing committee and consists of 24 members, 2 coming from each EU nation.

third programs include information and communications technology, increasing from 25% to 39%; new industrial technologies and materials, increasing from 11% to 16%; and biotechnology which increased from 5% to 13% (see Chart 12).

Area of Research & Development	Program III (1989-1994)	Program II (1987-1989)	Program I (1984-1987)
Information & Communication Technology	39	42	25
New Industrial Technology and Materials	16	16	11
Biotechnology	13	9	5
Energy	14	23	50
Environment	9	6	7
Human Capital & Mobility	9	4	2
Total Cost, ECU bn	5.7*	5.4	3.8

* Reportedly increased by .9 billion ECUs after the information in this chart was compiled.

Table 9. Funding Allocation (as a percent of total) within the EU's Framework Program

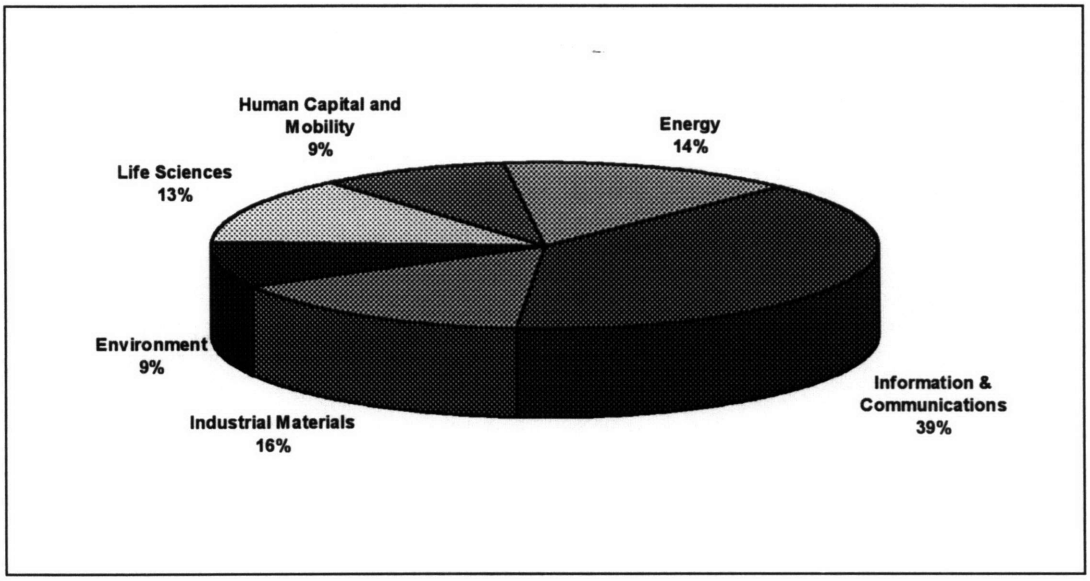

Chart 12. Allocation of Funds for the Third Framework Program

3.3.3 Framework's Direct Impact on the Construction Industry

As mentioned earlier, the direct impact of R&D conducted within the context of the Framework Program on the services provided by the construction industry appears limited, especially when regarded in light of the important role played by these industries in establishing the Single Market. A representative of the European Construction Industry Federation (FIEC) in Brussels, Belgium, commented that despite being allowed to compete for R&D funds within the Framework Program, construction R&D still tends to occur either within the structure of public research organizations at the national level or within private firms and universities. Through the efforts of its technical commission, the federation is actively involved in seeking ways in which the industry throughout the Union as a whole might be able to reap greater benefits from the R&D opportunities afforded by the Framework Program.[203]

Despite the low level of direct participation on behalf of the industry, there do exist two programs which can benefit the industry through direct participation, namely the BRITE/EURAM[204] program and the Thermie program. The following sections take a look at the more salient features embodied within these programs.

3.3.3.1 The BRITE/EURAM Program

In view of all subordinate programs within the structure of the Framework Program, the FIEC[205] considers the BRITE/EURAM program to be the most applicable R&D program suited for benefiting the needs of the construction industry.[206] The program is carried out under the purview of the Directorate of Technical Research[207] and the amount budgeted for

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[203]Source 84.
[204]BRITE and EURAM stand for Basic Research in Industrial Technologies for Europe (BRITE) and European Research on Advanced Materials (EURAM)
[205]Section 3.1.4 addresses the FIEC to a greater level of detail.
[206]Source 11.
[207]Source 57.

the program for the period comprising the third Framework Program, 1989-1992, was approximately 499.5 ECU's.[208] Although having experienced limited success, the FIEC has provided support in an effort to enable the construction industry to play a larger role in BRITE/EURAM.

Program Focus

The program encourages collaborative research and technological development (RTD) between industrial firms, universities, research institutes and "complementary centers of expertise in industry" in an effort to increase the competitiveness of European manufacturing industries within world markets. It additionally seeks to encourage the transfer of technology between industry sectors, in particular within those containing a high percentage of small & medium sized enterprises (SME's).[209]

Through its RTD focused efforts BRITE/EURAM aims to provide the technological "tools" which in turn will lead to better products and processes. This includes the development and application of new materials and engineering technologies and the more extensive integration and application of information technology developed elsewhere. The activities within BRITE/EURAM are given focus in accomplishing the strategic objective of improving the performance of industries by:[210]

- developing advanced materials and their processing for applications requiring improved physical and environmental behavior, better performance repeatability, reliability and cost effectiveness;

[208]Source 9. There are approximately .9 ECU's per dollar.
[209]Source 57.
[210]Source 57.

- incorporation of best practice into design (i.e. materials selection and design rules for manufacturing, assembly, reliability and maintenance);
- reduction of design to product lead time, including reduction of the manufacturing lead time;
- improving management of the manufacturing operation, including process control, product quality assurance and condition monitoring;
- improving the cost effectiveness of manufacturing.

An important distinction between BRITE/EURAM and other major programs subordinate to the Framework Program, such as ESPRIT,[211] should at this point be made. BRITE/EURAM "is focused on ensuring that manufacturing industries *recognize and develop the technologies needed to improve the performance of their products and processes* whereas ESPRIT sets out to *provide the technology base needed by system vendors.*" Other EU programs focus on yet different technology & industry-relevant issues. For example SPRINT, focuses on the transfer of technology, and COMETT addresses the need for skilled people in achieving success in technological innovation and implementation.

Project Proposal Evaluation

The program is open to all "industrial enterprises, research institutes, universities and other interested organizations within the EU or within the countries of EFTA." Projects proposed to the Commission for support under the program must be "collaborative, innovative and aimed at precompetitive research." Not only should a project demonstrate technical excellence and innovation, but it should also demonstrate a high degree of quality management, be highly relevant to the industry and have a high economic impact.

[211]ESPRIT-the European Strategic Program for Research and Development in Information Technology. Originally launched in 1983, its purpose was to revitalize the European IT sector.

Proposals are subjected to a rigorous and impartial evaluation procedure which ensures both an objective assessment and project confidentiality. Cost sharing research contracts, the primary means through which projects are funded, are subdivided into the two primary categories of Type 1, industrial applied research projects and Type 2, focused fundamental research projects. A third and relatively minor category of project funding, coordinated activities, supports other areas such as existing, related research and the promotion of research activity results. Type 1 projects consume up to 90% of the available budget whereas the amount consumed by Type 2 projects varies between 7% & 10% of the budget, depending on the amount used by coordinated activities. Pertinent features of these three types of projects are outlined in Table 10.[212]

	Type 1 Project	Type 2 Project	Coordinated Activities Project
Area of Focus & Features	• Industrial appl'd research • Precompetitive • Collaborative • Potential for exploitation • Subsequent development expected	• Upstream of Type 1 • Precompetitive • Collaborative • Industrial endorsement	• Within technical areas • In different member states • Coordination activities only • Proposers must justify activity
EC Funding	Up to 50% of full costs for industrial enterprises and universities	• Up to 100% for universities & similar institutions • Up to 50% full costs for other organizations	Up to 100% of coordination costs (no research costs covered)
Size of Project	• 10 man-years minimum • 1.0 to 3.0 million ECU's	• 10 man-years minimum • .4 to 1.0 million ECU's	None specified
Duration of Project	• 2 to 4 years	• 2 to 4 years	None specified
Partner Restrictions	• At least 2 industrial • At least 2 member states	• At least 2 organizations • At least 2 member states	As appropriate
Calls	Fixed closing dates	Fixed closing dates	Continuous

Table 10. BRITE/EURAM Project Features

[212]Source 57.

Key to the development of acceptable proposed projects under BRITE/EURAM is an understanding of the importance of the relationship between *program technical areas* and *priority themes*. All program technical areas fall within the fields of industrial manufacturing technologies and advanced materials applications and are structured such that maximum coverage of as many industries and disciplines as is possible is achieved. Priority themes, on the other hand, ensure that a necessary balance between the financial support available and the needs of industry is achieved. Proposed projects must address one or more priority themes and must also fall under the purview of a program technical area.[213]

BRITE/EURAM priority themes are:

- Projects where the results are likely to have multi-sectoral application in different enterprises are to be preferred.

- Proposals specifically related to Information Technology (IT) development and Integrated Circuits (IC) manufacturing are treated within ESPRIT and should be submitted there. BRITE/EURAM addresses directly the production and materials needs of manufacturing industry, including the use and customization of already existing IT solutions.

- The identified application requirements should be defined on the basis of a real industrial need, economic impact and other constraints, such as environmental factors.

- A system approach by a multi-disciplinary team is recommended. Also whenever appropriate, materials suppliers, product manufacturers and users should be associated in project teams.

- Models should be quantitative where possible and developed on a firm basis of scientific understanding, to maximize their accuracy, reliability and scope.

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[213]Source 57.

- The outcome of the project, if exploitable, should be regarded as both accessible economically and user-friendly, by its "customers." This is particularly important if those customers are SME's.

Shown in Table 11 are the various sub-components and their primary objectives within the program's four technical areas.

Technical Area	Primary Focus of Area
1.0 Advanced Materials Technologies	
1.1 Metallic Materials and Metallic Matrix Composites	• Extend components' working life • Increase thermal efficiency • Material processing techniques
1.2 Materials for Magnetic, Optical, Electrical and Superconducting Applications	• Develop improved materials for these applications
1.3 High Temperature non-metallic Materials	• Ceramics-based products design methodologies • Industrial applications for monolithic ceramics, ceramic composites & metal/ceramic interfaces • Strategies for processing and quality control
1.4 Polymers and Organic Matrix Composites	• Development of spec. application polymers • More efficient process techniques • Design rules for engineering polymers & composites • Increase recycling attributes of polymers • Improved product assurance techniques
1.5 Materials for Specialized Applications	• Improved materials and their processing for specialized applications

Table 11. Technical Areas within the BRITE/EURAM Program.

Technical Area	Primary Focus of Area
2.0 Design Methodology and Assurance for Products and Processes	
2.1 Quality and Reliability and Maintainability in Industry	• Improved performance measurement for manufacturing operations • More predictable behavior of products (environmental & physical) • Improved quality control strategies • Design rules for reliability and maintainability of components, structures & systems
3.1 Advancing Manufacturing practices	• Identify means to improve manufacturing practices • Transfer & adaptation of existing technologies
3.2 Manufacturing Processes for Flexible Materials	• Increased process flexibility • Reduced material waste • Improved process and product quality
4.0 Technologies for Manufacturing Processes	
4.1 Surface Techniques	• Cost effective surface treatment for indust. appl. • Techniques for Quality Assurance and surface treatment process control
4.0 Technologies for Manufacturing Processes, Continued	
4.2 Shaping, Assembly and Joining	• Shaping process and assembly methodologies • Joining techniques improvement • Testing of welds, bonds • Joining design methodology
4.3 Chemical Processes	• Improved predictability & yield in chem. proc. • Membrane materials & process improvement • New systems for hostile environment separation
4.4 Particle and Powder Processes	• Improved particle production to optimize product shape, structure and stability • Particle categorization and process performance • Handling and separation of particles • Cost-effective routes for high quality powder

Table 11, Continued. Technical Areas within the BRITE/EURAM Program

3.3.3.2 The Thermie Program

Whereas the BRITE/EURAM program affords members within the construction industry community the opportunity to participate directly in industry-relevant RTD, the Thermie program impacts the industry in a different manner. The program's direct influence is felt primarily by the building/housing sector of the industry, in that the program focuses a significant amount of its efforts towards widely disseminating the use of recently developed energy efficient building technologies. The program falls under the purview of Directorate

for Energy and was budgeted approximately 150 million ECU's for the period of 1990 through 1994.[214]

Program Focus[215]

The Thermie program strives to support the new economic and industrial framework established by the Single Market initiative in developing (& disseminating) a strong energy base using advanced technologies. Central to this goal is the reduction of Europe's dependency on other countries, which currently provide more than 50% of the required energy to fulfill its energy needs.

There are four specific challenges facing Europe that further influence the program's focus: the environment, central & eastern Europe, the integration of the EU's energy market and the need for economic and social cohesion throughout the EU.

In a response to the need to reduce the release of harmful emissions into the environment, Thermie conducts projects to exploit the "best available technologies" that will assist the EU in realizing its harmful emissions reduction goals. As a result of Thermie projects the goal of reducing sulfur dioxide and nitrous oxide by 110,000 tons and 190,000 tons per year, respectively, is being achieved. It is also estimated that with the assistance of Thermie, emissions of carbon dioxide will be lowered by 60 million tons per year by the year 2000. Thermie also attempts to "share advice with and give practical help to" the countries of central and eastern Europe in an effort to ensure their integration of new and clean energy technologies. It is accomplishing this through the activities of the

[214]Source 6.
[215]Source 6.

Organizations for the Promotion of Energy Technology (OPET),[216] which is establishing centers throughout central and eastern Europe.

Thermie also strives to support one of the goals embodied in the Single Market initiative, that of increasing the competitiveness of European industries, by developing and implementing newer, more efficient energy technologies. It also seeks to support efforts to ensure economic and social cohesion as the Single Market initiative continues to take shape by promoting new technologies throughout the isolated, rural regions of the Union.

Program Structure[217]

The program is implemented along the three different - yet complementary - fronts of project support, promotional measures and coordination activities.

Project Support

Project support consumes the majority of the funds earmarked for the program, currently budgeted at 85%. Projects receiving support must qualify under any one of the following four areas: rational use of energy, renewable energy sources, solid fuels and hydrocarbons. Projects qualifying for funds take two different forms: innovatory projects and dissemination projects. Innovatory projects, which receive a maximum of 40% of all Thermie funds, focus on applying *new* techniques, processes or products on a "sufficiently large scale for the first time," whereas dissemination projects, which receive no more than 35% of all Thermie funds, promote the broader use of *existing* techniques, processes or products which have not yet penetrated the market.

[216]Established by Thermie to encourage the implementation and exploitation of new technologies.
[217]Source 6.

Promotional Measures

The focus of this area is to encourage the wider application of technologies that are already available but are not well known due to insufficient market penetration. Thermie achieves this by dedicating no more than 15% of its budget to OPET, which promotes not only those products and processes resulting directly from Thermie sponsored projects but also those resulting from member state programs and elsewhere throughout the industry. The means through which OPET disseminates its information is through the conduct of market assessments, seminars, conferences, participation in fairs and exhibitions, the production and distribution of literature and site visits.

A review of OPET actions affecting the building sector of the construction industry carried out during between 1991 and 1993 reveals that a variety of relevant subjects were addressed across all EU member states, to include several of the recently democratized states of eastern Europe. Subject areas addressed include such areas as:[218]

Centralized energy management in buildings
Bioclimatic architecture & practical design
Bioclimatic architecture for energy efficiency
Passive solar heating & cooling for buildings
Condensing & low temperature boilers
Cogeneration for non-residential buildings
Building shell and energy efficiency
Efficient solar thermal systems in buildings
Environmental assessment of buildings in dsn
Tech. & financial engineering for medical blds
Efficient energy management in hotel sector
Energy management in sm/med retail stores
Rational use of energy in buildings
Export of building technologies in E. Europe
Energy efficiency in hospitals
Energy efficiency in office buildings
Energy use in municipalities & households
Energy saving in residential buildings
Rational use of VAC energy technologies
Advanced climatization systems
Energy efficient technologies in tourism sector
New energy saving lighting technologies
Energy efficient lighting in offices, schools, etc.
Energy efficient retrofitting of apartments
Energy saving in buildings by retrofitting
Insulation measures in retrofitting res. buildings
Energy savings in urban renewal in the EU
Savings in blds through improved retrofitting tech

[218]Source 5.

This information is disseminated through the use of seminars, workshops, publications, studies, audits (surveys), training and videos.

Coordination Activities

Thermie is active in the coordination of Union-wide energy technology-related activities. This is accomplished primarily by ensuring that work carried out by Thermie complements other initiatives carried out by the EU and its member states. Thermie also seeks to support those projects that involve entities from more than one member state, as such projects typically fail to qualify for funding at the member state level.

The program's greatest impact on the construction industry to date is in the exchange and dissemination of information encouraging the application of new technologies which lead to greater energy efficiency. This exchange of information will prompt the creation of new product markets throughout Europe as the application of these technologies increases.

3.3.3.3 The DRIVE Program[219]

One final program falling under the control of the Framework Program is that of DRIVE, or Dedicated Road Infrastructure for Vehicle Safety in Europe. The program's goal was to create the foundation upon which an integrated road "transport environment" in the field of information technology and telecommunications can be established. The program was conducted from 1989 through 1992 and, at a budget of 60 million ECU's, received considerably less funds than did the other two programs affecting the construction industry. The program included RTI technologies, evaluations of strategic options and specifications, protocols and proposals for standardization in several areas.

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[219]Source 9.

3.3.4 The EUREKA Program

The second prominent European R&D program is EUREKA. While the EUREKA Program is not conducted under the control of the EU's governing apparatus, as is the case with the Framework Program, its efforts are very real and its influence is felt by a wide range European industries.

The construction industry has been affected indirectly from R&D occurring in other industries under EUREKA, such as information technology and those fields more closely aligned with protecting the environment, but has gone untouched so far as R&D that affects it directly.

3.3.4.1 Background and Nature of EUREKA

The EUREKA program was proposed by the French government to the governments of other European countries in 1985 and is generally viewed to have been a response to the U.S. government's commitment to the Strategic Defense Initiative (SDI). It was envisioned that the program would serve to counterbalance the effects that SDI would have on the technological capabilities of several U.S. industries which, incidentally, were considered to already possess a considerable lead on their European counterparts.[220] To date, a total of twenty-one countries (with the recent acceptance of Russia) including the EU-12 contribute to EUREKA.[221]

Rather than relying on an over-riding, government-driven set of priorities which dictate the direction that research within industries will follow (as is the case with many national programs and the EU's Framework Program to a large extent), the program is founded on the bottom-up approach, whereby "ideas and initiatives born within firms are carried

[220]Source 1.
[221]Sources 22 and 74.

forward through collaborative research across national boundaries." In comparison to projects contained within the Framework Program, EUREKA projects tend to be much looser from the standpoint of control and organization. Their exists no central bureaucracy, no central plan and no set of rigid rules that must be followed. EUREKA projects also differ from those conducted under the Framework Program in that they tend to focus more closely on civil R&D that has a closer link to the marketplace. To this end, EUREKA seeks to foster an improvement in the competitiveness of European industries within world markets while contributing to the economic integration occurring throughout Europe.[222]

Funds provided by firms are typically matched by respective governments on a 50-50 basis.[223] In this regard, EUREKA can be viewed merely as a mechanism by which national governments finance favored projects.[224] The total amount of funds provided to date is substantial, amounting to approximately $13 billion,[225] and has been directed primarily toward large, multinational projects.[226] An audit of the program conducted in 1991 revealed that of the 520 projects launched up to that point in time only ten of them had actually brought new products into the market.[227]

Despite not relying on rigidly dictated priorities from a central authority, EUREKA did establish four areas of focus that it applied during the period of 1992 & 1993. These areas of focus are (1) data processing; (2) automobiles; (3) factories of the future[228] and (4) waste treatment. During this period the program is under the chairmanship of France. Of the

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[222]Source 22.
[223]Source 1.
[224]Note: many recent projects have been biased toward the environment.
[225]Of this amount the majority has been provided by the private sector.
[226]Source 22.
[227]Source 68.
[228]This effort is intended to reinforce France's and Europe's position vis-a-vis initiatives from Japan, such as IMS (intelligent manufacturing system program) and the U.S., such as the CALS program.

102 new projects receiving the EUREKA label, only 17 included participation from France.[229]

3.3.4.2 JESSI: EUREKA's Flagship Project

A major part of the EUREKA Program is the Joint Submicron Silicon Initiative, or JESSI, a project launched in order to develop a new microchip technology. Like its parent program, EUREKA, JESSI too was launched primarily in response a U.S. government action in the microchip field, in this case the creation of Sematech.[230]

Under JESSI, a multitude of partnerships between circuit manufacturers and circuit users were established. The program has brought together such power-house firms as Siemens, Philips, SGS-Thomson, Matra MHS and ES2 with public laboratories, such as CNET and LETI,[231] in addition to several manufacturers of specialized production equipment. The program's cost is estimated at $3.2 billion over eight years (1989-1997), of which France will put forward $1.1 billion, to be split evenly between the private and public sectors.[232]

But the record of JESSI has been anything but smooth and profitable sailing for those firms and governments involved. In 1991 the firm Philips, having experienced a loss in earnings and a subsequent shortage in cash, pulled out of the arrangement, almost causing the entire program to collapse. The EU, which does provide some financial support, then responded by cutting its contributions as did several of the companies that were participating in the program. The end result is that JESSI's 1992 budget was reduced by one-third. Ironically,

[229]Source 81.
[230]Sematech is a semiconductor research consortium backed by the U.S. government.
[231]These are public research institutions within France.
[232]Source 81.

it was an agreement made between two outside firms, one from the U.S. and one from Japan, and the firm Siemens that ultimately saved the program (for the time being).[233]

3.3.5 EU R&D Program's Assessment of Success

Having taken a close look at the two programs which influence the conduct of R&D within the EU, it is now appropriate that the success of these programs be addressed. The success of such programs is often difficult to judge since they "require long lead times and have a tenuous relationship to the marketplace."[234] Some conclusions can be drawn and, as one might expect, the results are quite mixed.

Without doubt, the Europeans have benefited from the process of structuring and running what can only be described as highly complex technology programs. They have made substantial progress in tackling difficult issues such as how to deal with intellectual property rights and how to achieve balance between the speed of attaining results versus fairness to all parties involved in the project. They have also learned much about the role that master plans play in such programs as well as the need to pursue programs that achieve long-term credibility throughout the R&D community itself. Another area of success has been found in the cooperation exhibited and relationships established not only between large and small firms but also between academia and industry, a traditional weakness of European R&D efforts. These achievements and lessons learned will no doubt prove to benefit the EU in its pursuit of future R&D programs and related policies.[235]

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[233]The two firms are IBM and Toshiba.
[234]Source 22.
[235]Source 22.

But what of those areas with shortcomings that clearly deserve additional attention and effort, such as the amount of the research being conducted, its relevance to improving the competitiveness of industries and the pursuit of diffusion over innovation?

Despite the size of most projects being large even by U.S. standards, amounting to several billion dollars annually, the question still arises, are they really big enough to make a difference? While many smaller firms appear to have reaped some benefits, the benefits afforded to larger firms have been more difficult to identify. For the larger firms in particular, do the EU funded programs actually relieve their own internal research department/efforts of a significant burden? Perhaps not when one considers that the R&D from programs, such as those within Framework, represents a mere 3% of the total. To reinforce the notion that such programs may be too small to make a substantial difference, consider the fact that the industrial giant Siemens' participation in ESPRIT[236] amounted to no more than 75 researchers at one time, whereas the company itself employs more than 20,000 at any one time. It is true that *some* advantage is obtained through the leveraging of funds through consortia but it is difficult to see how such leveraging ultimately leads to more than an *influence* at the margin. More so, the actual source of the influence is the specific type of research that is being funded and is not derived merely through providing more funds.[237]

Another important issue arising is whether the research being conducted is actually commercial enough. Since most research conducted within such programs is limited to *precompetitive research*, it often has little to offer in terms of boosting a firm or industry's competitive edge within the market place. Aware of this, the EU has been trying to shift

[236]ESPRIT falls within the structure of the Framework Program and for the period from 1988-1992 was budgeted to receive approximately $1.9 billion from the EU.
[237]Source 22.

programs closer to the market but, in attempting to do so, has hit many political complications.[238] Yet another area requiring attention is that of diffusion versus innovation. The experiences within many programs show that many programs designed originally to foster technological innovation have actually proven to be much more effective at merely diffusing technology. Having learned from this, ways of improving programs so that they truly spur on innovation must be explored and adopted in future EU R&D programs & policy.

3.4 The European Construction Industry Federation's (FIEC) Role in Shaping Policy[239]

The role played by the FIEC in influencing the "shape" of EU policy as it relates to the construction industry will now be addressed. It is helpful, though, to first address the FIEC in terms of who they are and what their mission is.

Structure and Mission

The federation represents 28 national member construction-related federations active within 21 separate European countries. The member federations represent firms of all sizes from all building and civil engineering sectors which practice all kinds of contracting methods. The federation has been in existence since 1905 and is the European founding member of CICA, the Confederation of International Contractors' Association. Altogether it represents the interests of over 1,520,000 firms with a combined employee strength totaling upwards of 8,000,000.

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[238]Source 22.

[239]The European Construction Industry Federation. Information for this section comes from Source 11.

In representing its member federations, the FIEC lobbies those European institutions that directly impact the European construction industry. It should come as no surprise that the FIEC has been actively working with the EU Commission on all matters that either directly or indirectly influence the construction industry with the intent of ensuring that the industry's interests are protected.

As can be seen in Diagram 1, the FIEC is structured such that it can best impact the decisions of the Commission along the many fronts on which the policy and legislation that can ultimately impact the construction industry is enacted . Working directly with the Commission's General Assembly is the FIEC's steering committee, ensuring that actions & issues requiring FIEC attention are properly prioritized and handed down to one of the three subordinate FIEC commissions[240] for coordination and action.

The three commissions are further subdivided into groups focused on individual disciplines and it is here that the "leg-work" between the industry, the federations, sister organizations and any number of entities that fall within the framework of the EU's governing apparatus (the European Commission, the European Parliament, etc.) occurs. At this time some examples of the recent efforts of these commissions to help shape the course of EU policy will be addressed.

Economic and Legal Commission

The Economic and Legal Commission of the FIEC has been involved in a number of diverse areas related to the economic and legal aspects of the industry. As the FIEC's representative, it has collaborated extensively with a consultant appointed by the EU Commission to conduct what is referred to as the Strategic Sector Study. The purpose of

[240]The three commissions are (1) Economic & Legal, (2) Social and (3) Technical.

the ongoing study is to take a close look at the trends and anticipated needs within the industry - with a particular focus on the effect of government policies on the industry - and to provide relevant recommendations to the EU Commission.

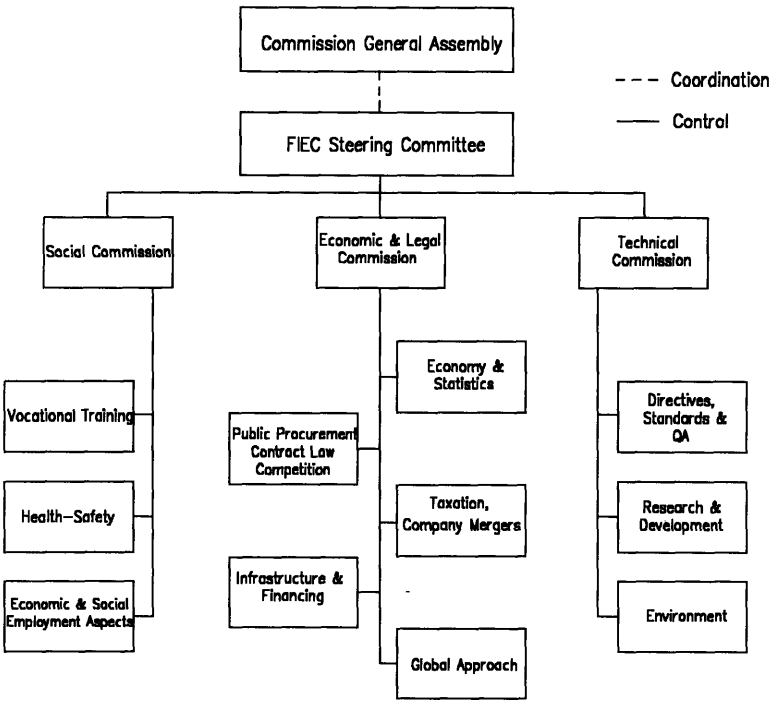

Diagram 1: Organizational Structure (simplified) of the FIEC

The commission recently served as the coordinator between four EU Commission working groups[241] to arrive at a "coordinated opinion" regarding liability and warranty issues within the EU's construction industry. The coordinated opinion, although not representing a position taken by the FIEC, is spelled out in the resulting GAIPEC report. The FIEC's acting in this capacity represents *the first time that the EU Commission has tasked out the responsibility of preparing an initiative to those that actually represent the industry to be affected.*

[241]The four working groups represented the interests of customers/clients; planners; contractors and building materials producers.

In 1993 the Commission issued to the CEN[242] working group a study mandate regarding the feasibility of developing a qualification system for construction firms operating throughout the Union. The FIEC's concern is that input provided by additional experts, other than those that are oriented solely on technical skills as is the case with CEN, would be needed for CEN to provide a feasible recommendation. Although the results of the commission's efforts are not yet known, its intent was to create an FIEC consolidated position based on the input provided by its own experts within the various commissions throughout the FIEC. Bolstered by the support of its member federations it would then work directly with the CEN working group to devise a recommendation that would "avoid the institution of a bureaucratic system which may lead to unfair competition and interference in the activities of contractors."[243]

Social Commission

The Social Commission is active in collaborating with the appropriate EU Commission sub-committees and other industry related organizations, such as the European Construction Union's FETBB, in organizing conferences in the fields of vocational training and health & safety.

The commission has represented the FIEC on its position (which in turn was taken on behalf of its members) on many different EU directives such as the "secondment of workers" directive. The "protection of the employees" within the construction industry occupies much of the commission's attention, whether attempting to guard the rights of employees caught within a firm in the process of transferring from the public to private sector or attempting to seek exemptions for construction workers from an EU directive that would mandate a "harmful" adaptation of working time. Additionally, the commission

[242]The European Committee for Standardization.
[243]Source 11.

has been active in conducting studies and inquiries regarding the impact of safety and social issues on the construction industry.

Technical Commission

The Technical Commission works closely with the four main institutions throughout the EU that not only influence the shape that standards-related policy and regulations take with "a view for ascertaining the key points and a possible strategy or common approach for the construction industry."[244] The four main bodies it works with are CEN, EOTA, EOTC and Subcommittee DG III of the EU Commission.[245]

Specifically, the commission has been active in influencing policy contained within the Construction Products Directive (CPD) which has been slowed in its implementation while awaiting the issue of interpretive documents.[246] It is also active in providing input in developing the FIEC position regarding the feasibility of a standard procedure for qualifying construction firms throughout the EU. Additional efforts within the commission have resulted in the publication of many helpful industry-related manuals and glossaries.

The FIEC's Concerns Regarding the Future[247]

Some insight as to the direction in which the construction industry at the EU level will attempt to move can be gained through the words of the FIEC's current president, Mr. Niels Frandsen. In a message he published in mid-1993 he states that the EU's construction industry should strive to achieve four distinct - yet interrelated - goals in the upcoming years:

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[244]Source 11.

[245]CEN: European Committee for Standards; EOTA: European Organization for Technical Agreement; EOTC: European Organization for Testing and Certification.

[246]Please refer to Section 3.3 for additional information on this directive.

[247]Source 11.

- To increase the viability of projects while reducing project costs;
- To better "rationalize" (justify) its activities;
- To increase efficiency of its activities;
- To find more economical ways of performing business.

Mr. Frandsen further contends that increased investment in at least four important areas is necessary if the industry is to achieve these goals:

- *Research & Development.* Increased investment is needed here in order to ensure that the industry does not fall behind its competition both within and without Europe.

- *Training.* Increased investment must be focused towards reducing existing shortages in skilled management and labor alike as well as in reducing the number of work accidents.

- *Development of New Methods for Financing Projects.* The shortage of funds within the public coffers means that alternative financing mechanisms must be developed and employed, particularly within the field of infrastructure projects.

- *Upgrade the Image of the Construction Industry.* Investment should occur which seeks to improve the "quality" of all activities within the construction sphere.

3.5 Summary

This chapter has highlighted the more salient means through which the EU and its Single Market related policy is impacting - and will continue to impact - the construction industry throughout the Union. Policy affecting the construction industry was broadly discussed within the context of affecting either the construction product or the construction process.

Under the heading of the construction product, the ongoing efforts at the Union level to standardize not only the products used within the industry but also the building codes themselves, to include some of the possible ramifications of such policies, were explored. A wide range of EU legislation regarding the environment, admittedly not as overt in affecting the product of construction as are the other topics, to include a variety of factors that influence this area of legislation, was also addressed within this section.

The Single Market's impact on the construction process was discussed at length. It was demonstrated how laws affecting the manner in which contracts are tendered and awarded are changing the competitive "lay of the land," ultimately affecting the process of construction. Other features impacting the process of construction, albeit in ways less apparent, were also addressed. These features include the unification of customs legislation, the liberalization of the financial services markets, the intellectual property rights of firms and the standardization of quality assurance programs within firms.

The efforts taken at the Union level to increase the competitiveness of its industries through the sponsoring of R&D carried out within the context of the Framework program were discussed. Those programs that affect the construction industry directly, namely BRITE/EURAM and Thermie, were explored in detail. The EUREKA program, although the primary sponsor of the initiative is not the EU, its focus and its flagship program JESSI were then discussed. It was seen how the construction industry to date has played an insignificant role in the conduct of research and the development of technologies within either program.

The chapter closed by taking a look at one significant body that influences the nature of policy arrived at the EU level on behalf of the construction industry, namely the European Construction Industry Federation. Through its three commissions, technical, social and

economic & legal, the federation serves as the industry's voice on issues affecting the industry at the member state as well as Union levels.

It was demonstrated how much of the policy affecting the Single Market, and the construction industry within the market, is either still being developed or is in its initial stages of implementation. It will be some time before the full impact of much of the policy affecting the industry is felt, especially in light of the recession that Europe is just now climbing out of.

4.0 The Single Market's Impact: Perspectives of those within the Industry

The thesis to this point has focused primarily on the motivations and actions of the framers of the EU's Single Market and the institutional structures that they comprise. Their actions, most often seen in the form of policy and legislation devised at the Union level, potentially impact both the *product* and the *process* of construction within the industries of member states as well as throughout the Union as a whole. The material covered to this point is fundamental to a thorough understanding of the Single Market and its impact on the industry. This last chapter addresses the opinions and views of those within, or in close concert with,[248] the senior management of firms within the construction industry.

The observations and opinions of such individuals help one to see first hand the impact of the Single Market on the industry. They were acquired through the conduct of interviews which enabled individuals to comment freely on those issues and areas that they regard as relevant to their businesses in light of the Single Market. Although the individuals consulted are from three countries - Germany, Italy and Spain - their experience within a range of sectors and locations throughout the Union enables one to draw conclusions pertinent not only to the activities within their individual countries but within the larger Union.

It is important to point out that there exist certain factors and conditions, that neither contribute to the "cause" nor are the "result" of the Single Market initiative, which make any analysis of the Single Market's impact on an industry challenging. The most notable of these factors and conditions are:

--*the recessive state* of most member states' economies

[248]These individuals include consultants and members of academia that deal closely with senior management.

--*the Single Market's relative youth* and the ongoing development of policy & legislation vital to its being

--*the capitulation of communism* in Eastern Europe and the shift of former Warsaw Pact countries away from centrally planned economies toward free market economies

--the fragmented state of the construction industry in terms of firm size and industry sector focus

--ever present macro-economic variables

As those interviewed often pointed out, these conditions and factors can effectively blur and/or delay noteworthy causal relationships between the Single Market and the construction industry.

The information is presented within a framework comprised of those areas of the construction sector most notably affected by the Single Market's implementation. This chapter closes with conclusions drawn from the information presented by this thesis.

4.1 Reduced Border Controls: the Merging of Markets

This section considers the predominant effects of the Single Market initiative within the context of the construction industry on the tenet which forms the market's cornerstone: the free movement of goods, services, capital and labor.

All parties interviewed acknowledged that the cross border flow of **goods** now goes practically uninhibited, creating the outward appearance of completely transparent intra-

EU borders.[249] The volume of flow, in terms of both exports and imports, between many countries of certain types of products has increased notably; but this increase has not been seen within most sectors of the construction industry. The main exception is in certain types of products used predominantly in the finishing stage of buildings and housing.[250]

While having an overall positive effect on the flow of goods across intra-EU borders, the reduction in customs controls in itself has not yet resulted in any marked impact on the construction industry. Attributing any increase in the flow of certain products *exclusively* - or even primarily - to the creation of the Single Market fails to acknowledge the role played by other business-related factors at work; factors that have remained largely untouched by the market.

For example, *exchange rate differences* between countries continue to influence trade and will do so until all member states' currencies are solidly linked to one currency unit *or* share a common currency, a yet to be fulfilled goal of the Single Market. The *relative costs of like products*, strongly influenced by cost of labor consumed in the manufacturing of the product, also influences the volume and direction of trade between countries. Stark differences in employment policies and laws[251] between member states affects the cost of products and, ultimately, the attractiveness of products within intra-EU markets.[252] The relative costs of products always has played a significant role in trade and will continue to play a prominent role as long as differences in costs exist. The *degree of product standardization* is yet another area that potentially affects the intra-EU flow of products.

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[249]For additional information please refer to Section 3.2.3.
[250]Source 87.
[251]Most visibly reflected in areas such as mandated wage levels and employer covered security and social-related benefits.
[252]This point was made by both German interviewees.

This area, like that of exchange rate control, is to be addressed in greater detail at the Union level later this decade.[253]

Perhaps more important than either of these three factors is the role played by the *general health of the economy* in the demand for construction related products. The recessive state of most European economies since the Single Market's inception has no doubt stymied and delayed - even deadened - much of the positive potential side effects of the Single Market. The effects of the market will increasingly become more apparent in subsequent years as economic growth fuels intra-EU trade.

An example of the effects on one member state's construction products-related trade resulting primarily from the exchange rate differential, and, to a lesser extent lower labor costs, can be seen in Italy. Over the past several months the Italian lire relative to most major currencies, most notably the German mark, has steadily declined in value. This weakening of the lire has resulted in a reduction of imports of almost all construction related products - save for unique products such as special cement strengthening additives - and a corresponding increase of exports within many product markets, such as those related to the finishing stages of housing and building projects. This attractive climate for Italian exports has even led to the leveling of "dumping" charges against some Italian producers of construction materials.[254]

The comments of the director of Western and Eastern European operations for a large construction firm headquartered in Germany shed light on the merging of construction product markets within the Union. According to him, the Single Market's advent has not changed the manner in which his organization approaches the procurement of construction

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[253] By current estimates, 1997 or 1998 for construction products. For additional information see Section 3.1.1.
[254]Source 86. One market--that for concrete reinforcement bars--in particular has been implicated by such charges.

materials. As was the case before the market's creation, the most important factors considered when purchasing materials and supplies are *compliance* with the project's specifications and *cost*. Local sources continue to be relied upon most often to meet procurement needs for materials and supplies. He admitted that recently--more often than was the case in the past--products from elsewhere have been found to yield an advantage in lower costs and are used when undertaking a project of a unique nature or when procuring the assortment of materials required during the finishing stages of a project, such as a turnkey office building.

The predominant reliance on local suppliers for construction materials used in the early and primary stages of many projects is not surprising. Due to the commodity nature of many of the materials used in these stages, there does not exist a substantial difference in prices compelling a purchaser to favor one brand of the product over another. Going elsewhere to purchase such materials would not yield a significant advantage in costs and, furthermore, any advantage realized would likely be mitigated by the increased costs associated with transporting the materials.

The comments of a Mr. M. deAngelis, a senior manager within the Italian firm of Pizzarotti C-SPA,[255] complements those of his German counterpart when he stated that his firm now has access to a greater variety of products covering a wider range of prices. His firm has realized reduced costs through the purchase of materials such as cement from Greece and glass products from Germany; products for the most part that were generally too expensive to purchase from these member states prior to the market's opening. He anticipates additional benefits resulting from the *combined effects* of the reduction of customs controls

[255]Headquartered in Parma, Italy, the general contracting firm splits its efforts evenly between the private and public sectors in Italy and focuses almost exclusively on public works outside of the country (France and Spain) through its branch office in Paris, France. Quite large by Italian standards, the firm employs approximately 1000 people and generated revenues of $.33 billion in 1993.

and product standardization being achieved through lower costs incurred through bulk purchases of many supplies and products. Currently, it is the lack of standardization of construction products that primarily dissuades firms from benefiting in this manner.[256] As discussed before, just how much of this change can be attributed directly to the Single Market is difficult to say. It is, however, fair to say that the market's role is one which condones or fosters the merging of product markets rather than one which prohibits or discourages such a merging of markets.

Although not able to comment specifically about the effects of the merging of construction products markets, Mr. Norberto Irezabal, the Commercial Director of Overseas Department for the Ferrovial Group, does anticipate his firm benefiting from the *combination* of the merging of products markets and the standardization of products. In his opinion, firms will derive their greatest benefit in that products will in essence possess a "guaranteed level of quality." According to Mr. Irezabal, the second most notable benefit, resulting from these two initiatives is that firms will benefit from a general increase in product variety. He further added that fast conformance to the specified product standards will be vital to the survival of both the manufacturers and the suppliers of construction products once the new standards are established.[257]

Whereas the Single Market's impact on the intra-EU movement of construction related products to date appears less noticeable, its impact on the movement of **construction related services** is more apparent. The positive effects of the market are felt primarily by the larger construction firms; those that were internationally focused before the advent of the Single Market.

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[256]Source 82.
[257]Source 85.

According to the director of Western and Eastern European operations for a large construction firm headquartered in Germany, his firm - primarily through affiliates - is now able to finance projects in many countries at rates that were not possible to obtain prior to the Single Market. These significantly lower rates have provided the firm a competitive edge in that it can now fund projects at lower costs through its affiliate companies abroad. Prior to the financial markets' liberalization,[258] local public authorities could prevent firm's executing contracts on their behalf from seeking sources of financing outside of their region. Now, primarily because of the financial markets' liberalization, construction firms can exercise greater flexibility in that they can shop abroad for the most competitive sources of financing within the Union *and* in that they are more able to rely upon parent organizations from other countries to assist them in the financing of projects.

But going abroad for loans possessing more attractive rates in many instances does require either the ability to mitigate and/or a willingness to shoulder additional risks. One major factor that firms must consider is the risk associated with fluctuations in exchange rates. As long as the currencies within Europe are themselves not unified, whether through acceptance of a common currency or through rigid, mandated rate controls, this factor will continue to influence a firm's decision on where to seek its financing for a given project. According to Mr. deAngelis, many Italian firms are discouraged at the moment from seeking loans from elsewhere within the Union because of the weak condition of the lire. This, however, does not mean that Italian firms may not benefit from lower rate loans acquired through Italian lending institutions.[259]

Not surprising, the **size of the firm** plays a significant role in this changing market. Large firms not only are more capable of backing loans (primarily through their shareholders)

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[258]For additional information please refer to Sections 1.2.3 & 3.2.4.
[259]Source 82.

drawn by affiliates to fund projects, but are also able to lend their expertise and experience in the area of project development.[260]

Larger firms also appear more capable of absorbing the **new reporting requirements** imposed upon firms as a result of the disappearance of the customs stations located at border crossings. Firms conducting business across intra-EU borders have in essence absorbed the functions of the customs stations in their internal reporting requirements, now having to report all resources exported to the country in which the project is being executed. For example, products exported from Germany to Spain to be used in a project undertaken by a German firm in Spain would be reported by the German firm through its internal reporting procedures as an export to Spain. The added reporting requirements imposed upon firms is "quite complex, requiring a lot of time" and its adverse, burdensome impact is felt more strongly the smaller the firm is.[261] The ultimate owner of the project is then responsible for any value added tax (VAT) applicable to the completed project. Despite the present lack of a standardized system of **VAT** rates and reporting procedures within the Union, the consensus amongst those interviewed is that the current transitional period does not create any significant threats or opportunities for construction firms.[262]

While threats or opportunities for construction firms resulting from the current discord in VAT rates across Europe may not be apparent to many, the differences in rates between member states ultimately can influence the attractiveness of construction activity within various sectors between various countries. According to Mr. Norberto Irezabal, the Director of the Overseas Department for Ferrovial,[263] Europe cannot have a truly

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[260]Source 89.
[261]Source 89.
[262]Sources 89, 86 and 83.
[263]Ferrovial is a large Spanish construction company located in Madrid, Spain. Their specialties are construction and infrastructure development. The firm has over 25 years experience in the use of the build operate transfer (BOT)

transparent market *with equal opportunities for all competitors* until harmonization in VAT is achieved. The example he cites compares the current rates for two Union member states, the U.K. and Spain. In the U.K. there is one standard VAT, currently at 17.5%, that applies to all projects whereas in Spain there are two different VAT's, one of 6% for buildings such as hotels and restaurants, and one of 15% for all other projects. Such a variance in rates obviously affects the attractiveness of certain projects, which in turn influences the growth - and construction activity - within various, often disparate sectors. Such differences will influence opportunities for construction firms that focus at either the national level or the Union level.

In the area of **bonding,**[264] Single Market related actions have contributed to making operations in other Union countries less cumbersome than in the past. Prior to the market's advent, a construction firm from headquartered in a member state other than the one in which it desired to work was often required to "consult with local resident banks for the provision of guarantees." Firms now are afforded greater flexibility acquiring bonding in that may either work with "local" banks, that is banks within the region of the project - something that may require counter-guarantees from elsewhere - or with banks from their home country. Although this issue alone would seldom have prevented a firm from doing business within the other member state, it nonetheless was an added burden that, when combined with the other burdens of doing business abroad, could make conducting business in other Union countries undesirable.[265]

But as is often the case with enacting legislation that positively affects industries within the Union as a whole, there are inevitably some member states, particularly in light of the deep

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method of project finance & development. In 1993 the firm realized approximately $1 billion in revenues, 85% of which was in construction.

[264]This includes bonds covering performance, warranty period and advanced payment.

[265]Source 89.

involvement of the state in economic & market areas, whose conformance to the new requirements imposes burdens, particularly in the short term, on indigenous industries. Such is the case with Italian construction companies, whose rated credit capacity, because of Single Market related legislation, are now directly affected by degree to which the companies bonding capacity is tapped. Italy was somewhat unique prior to the Single Market in that - unlike certain other Union members such as Germany, France and the United Kingdom - the extent to which a company had realized its bonding capacity had no direct impact on the volume of funds that could be credited to firms. Legislation enacted now directly relates the two and many Italian firms are feeling the consequences adversely, especially those that focus on public and civil works where a high bonding capacity is critical to conducting business.[266]

Although the **insurance** sectors are almost fully liberalized throughout the Union, regional differences still exist concerning the requirements that insurers must meet in order to operate within the region. These requirements are often made in the name of consumer protection and, in the opinion of those interviewed, does not significantly hinder firms from other member states desiring to conduct business within other member states.

In at least one member state - Italy - it seems that through insurance rates some U.S. firms may even possess a distinct competitive advantage over their Italian counterparts. According to Mr. Francesco Mondini, a consultant for the Ordine degli Ingegneri della Provincio di Napoli, U.S. insurers of construction companies, unlike their Italian counterparts, are able to pass on significant savings to those firms they insure, primarily because of their ability to accurately assess risks, which can afford U.S. firms decided

[266]Source 89.

advantages through lower costs. He added that there is currently only one non Italian insurance firm - from Switzerland - that insures Italian construction companies.[267]

The management of large Spanish construction firms desiring to increase their market share outside of Spain have been encouraging federal authorities to better "adapt" export insurance to the construction sector. Spanish firms desire to see a system that is similar to those already existent within France and Italy, where the government export credit coverage is more responsive to the construction sector. The need of these firms to convince authorities of the added economic benefits derived through active government encouragement of construction exports, primarily in civil works, has proven particularly challenging, according to Mr. Irezabal. It is his opinion that changes are forthcoming which will serve to benefit such firms as his in acquiring work outside of Spain.[268]

Of the four areas in which the Single Market initially seeks to promote freer cross border flow,[269] the **movement of people** between member states for reasons of employment appears to have been impacted the least by the market's advent. According to all individuals consulted, the largest single factor contributing to a lack of movement of individuals within the market is differences in language. As one would expect, the need to be fluent in another member state's native language diminishes the more rational the task at hand becomes. This reality, in concert with such factors as ever-present macro-economic forces, employee regulations/quotas and even the geographic location of the country, has permitted a noticeable movement of lower level blue collar workers into certain Union countries.

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[267]Source 86.

[268]Source 85.

[269]The individuals are free to pass from one member state to another, the movement of people in this respect refers to the temporary or permanent movement for reasons of employment.

Germany has been most noticeably affected by a significant influx of workers from both less developed Union states and Eastern European countries. While shortages within the ranks of many blue collar trades in the recent past[270] elicited cries within industry for government support to permit the freer inflow of workers from abroad, recently established quotas are adversely affecting the supply of workers within certain trades needed by the industry. The organization that champions the needs of contractors with the government - the Hauptverband - is now working with the federal government to seek a more lasting solution.[271] Within Italy another issue altogether, the criteria through which work permits are issued, is minimizing the movement of workers from outside of the country into positions within construction trades. Unlike many other industries, where an employee's tenure with a firm is not linked to a fairly well defined duration of time, the tenure of many employees within construction trades is determined by the duration of the project. Italian authorities currently do not issue permits on this basis which in turn is limiting the inflow of such workers into the country.[272]

Within the ranks of most professionals the intra-EU movement of individuals has been minimal. As does responsibility and the degree of exposure to personal contact and interaction increase with position, so does the importance and necessity to be fluent with the host nation's language play a greater role. Whereas all individuals consulted agreed that the largest single factor contributing to a lack of movement of professionals within the Union is differences in language but one individual in particular - Mr. Irezabal, from Spain - claimed in the case of Spaniards, another factor played an even more important role: closeness to one's culture. According to Mr. Irezabal, the closeness a Spaniard feels to his culture compels him to stay relatively close to his family and people, making him feel out of

[270]Resulting primarily from German reunification.
[271]Source 89.
[272]Source 86.

place when working within another country. Although this factor plays a role to some extent in any culture when its member's move abroad, by comparison with individuals from other countries[273] the reluctance exhibited by Spaniards to move abroad is much greater.[274]

4.2 The Changing Face of Competition; Adaptive Measures and Trends

As discussed earlier, the larger construction firms often possess advantages inherent in their size that enable them to more ably respond to some of the opportunities - and even burdens - resulting from the Single Market. Advantages they possess include the ability to more efficiently finance and manage projects, both through subsidiaries and on their own, and the ability to more readily absorb newly mandated customs reporting requirements. *In light of the scale and scope of market reforms* it should come as no surprise that the Single Market's impact is felt most directly by the larger construction firms.

Small and medium sized construction firms also feel the market's impact. Those ones operating within national markets close to borders with other member states, tend to feel the market's impact more directly than similar firms operating within markets away from common borders. In Spain, for example, markets within the region along the French border have seen a marked increase in competitive activity due to French firms attempting market penetration. This same phenomenon is true elsewhere throughout the Union where member states share common borders.[275]

Although not directly linked to the Single Market, a similar situation exists in Germany, where small and medium sized indigenous firms are faced with serious competition from

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[273]Germans, Dutch and Swedes are cited as less reluctant to move abroad.
[274]This applies primarily to the ranks of middle management and below. Source 85.
[275]Source 85.

firms coming from countries of significantly lower relative employment costs. The greatest impact has been felt from firms coming from the Eastern European countries of Poland, Hungary and the Czech Republic, but has also been felt from firms originating in other Union countries such as Spain and Portugal. According to Professor Spranz of the Fachhochschule für Technik, Stuttgart, this activity currently poses itself as *the* biggest threat to small and medium sized firms in Germany.

The activity of such firms has been focused primarily on non technical, labor intensive tasks, as it is through lower employment costs that they achieve a competitive edge which enables them to displace German competitors.[276] Although foreign firms operating within Germany are subject to many of the same labor & employment regulations[277] that contribute to increased labor costs for indigenous firms, an effective system that enables authorities to verify strict compliance does not yet exist. As a result, many such firms often operate illegally and are able to derive a significant competitive advantage in costs through noncompliance with labor and employment regulations.[278]

It is this very issue, the relatively higher cost of employment in Germany, that not only is keeping many indigenous small and medium sized firms from competing effectively within their own market, but also is preventing larger German firms from competing effectively for opportunities elsewhere within the Union. According to the director of Western and Eastern European operations for a large construction firm headquartered in Germany, this is probably the largest single issue facing his firm and others like it in Germany. It is his opinion that there exists "no suitable solution at the moment."[279]

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[276]Professor Spranz, who also works with the medium sized general contractor Baresel AG in Stuttgart, Germany, stated that such firms employment costs are up to 50% less that of their German competition.
[277]Primarily those that cover social, health and employment benefits.
[278]Sources 88 & 89.
[279]Source 89.

Due in no small part to the Single Market[280] there has been a significant increase in new relationships of firms of all sizes. There has been a tendency for larger firms to enter into relationships with smaller firms, both on an interim, project basis and on a longer term basis through acquisition. Not surprising, such relationships prove useful as a means of penetrating new markets[281] in addition to serving as a means of survival when work within traditional markets is either nonexistent or hard to come by. Firms joining together into such arrangements often seek to benefit mutually through the sharing of needed expertise, improved project financing abilities, improved bonding capacity and--ultimately--survival within the market.[282] While there are several examples of larger firms having acquired smaller foreign firms only to later regret having done so,[283] it is the opinion of many of those interviewed that it is still too early to assess how successful many of these new relationships.[284]

The forces affecting the competitive "lay of the land" within the construction industry in Italy are forcing many Italian firms to respond accordingly. According to Mr. Mondini, many Italian general contractors, which tend to be very small in size when compared to their counterparts in countries such as France, Germany and Great Britain, have been joining together and forming partnerships.[285]

The increased size achieved through partnerships is enabling these Italian firms not only to "defend" territory within Italy against larger firms - both indigenous and from elsewhere within the EU - but to seek work within foreign markets as well. Due to the inability of

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[280]Also no doubt due to lack of construction demand throughout many sectors in Europe. The lack of work within traditional geographic and market sectors has forced many firms to expand into other markets.
[281]Geographic, product/service type and buyer type.
[282]Sources 82 & 89.
[283]Source 83.
[284]Sources 88 & 89.
[285]Source 86.

these groups to compete effectively against larger firms from within other member states' markets (Germany and France, for example), they have increasingly directed their attention to the Eastern European countries of Hungary, Poland, Romania, Belorus and Russia to seek work. Although the volume of work in the last two years has been quite low, it is the opinion of Mr. Mondini that the significant growth experienced in 1993 will be followed by continued healthy growth in the years to come. He further adds that the need to establish an indigenous contact that has direct access to those public bodies that affect project procurement is a critical lesson learned by Italian firms operating within such markets.[286]

A central element influencing many of the changes occurring within the market place is the need for today's firms, much more so than was the case in the past, to clearly differentiate themselves from their competition in some manner, enabling them to provide significant **added value** to a project in a manner not provided by competing firms. According to Mr. Irezabal, those firms that are able to provide this added value, whether provided through the use of a new technology or through the use of a more efficient or attractive financing mechanism, are much more likely to succeed within the new landscape created by the Single Market. In the case of Mr. Irezabal's firm, Ferrovial, the added value that they are capable of delivering and therefore promote is the use of the build-operate-transfer (BOT) method of project financing and delivery.[287]

While **BOT** offers clear advantages over other means of project financing, most noticeably the ability for financially-strapped authorities to initiate needed projects, it has to date received mixed reviews within most Union countries. At one end of the spectrum is the Union country which has most agreeably embraced BOT- the United Kingdom - and at the

[286]Source 86.
[287]Source 85.

other end lie most other Union countries, to include those covered through the course of the author's interviews.[288]

It is the overriding opinion of those consulted in Germany that it will still be some time before some form of BOT is both accepted and widely implemented within the country. The method has been used on a limited scale in the eastern portion of the country in areas of sewage treatment and water distribution where both the certainty of the investment and the responsibility of providing the needed returns are fairly straightforward and easily assigned.[289] The use of BOT as a means of financing the federal highway system, or Autobahn system, has been widely discussed but has received little visible positive support from the government. The federal government's reluctance to "place burden's on or limit the freedom's of future governments," as evidenced by their lack of incentives in the form of guarantees or cofinancing, has to date kept such ventures from being realized.[290]

The outlook for BOT's future in Italy is perhaps even less promising than in Germany, as those interviewed indicated a complete lack of willingness on the part of the government to make the necessary concessions. Attempts in Italy, although limited to such projects as parking garages, have resulted in more failures than successes primarily for this reason.[291] Although used quite extensively for a variety of project types in Spain, as evidenced by the firm Ferrovial's 25 years of experience with BOT,[292] the recent trend in Spain indicates a reduction in the opportunities for BOT. A significant cause of this trend no doubt is Spain's

[288]Namely Germany, Spain and Italy.
[289]Sources 88 & 89.
[290]Source 89.
[291]Sources 89 & 82.
[292]The Ferrovial Group successes in applying the BOT method range from such sectors as toll roads, parking garages, bus terminals and cemeteries.

current socialist government who, by nature, is reluctant to place such responsibilities in the hands of the private sector.[293]

A means through which many firms throughout the Union are seeking to differentiate themselves from their competition is through the implementation and documentation of **quality assurance systems** within their organizations. Although member states vary, both in terms of the pervasiveness of either as ISO 9000 or EN 9000 in use and in the expectations and demands placed on firms by potential clients, the documentation of such systems within organizations is on the rise throughout most Union countries.[294] The documentation of such systems is most pervasive amongst larger firms and is playing an increasingly important role within the marketing efforts of firms throughout most Union countries.

Those interviewed within the German market felt that German firms have responded somewhat slower to ISO 9000 and EN 9000 than their competitors from elsewhere within the Union; specifically France and the U.K.. They cite as a likely cause the combination of already existing quality assurance systems, primarily those required by the industry, and the relatively high demands in quality that have always been placed on firms by their clients within both the private and public sectors. Not surprising, these two factors have to date made any additional systems redundant if not unnecessary. The advent of the Single Market and the resulting increase in the number of competitors from abroad is making the continued adoptance of these systems by German firms more and more important to survival within the market place. The adoption and documentation of such systems is becoming less an option and more a necessity within most of Europe.

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[293]Source 85.
[294]Sources 88 through 85.

While it is evident that many of the changes occurring within the Single Market are affecting the competitive lay of the land on which European firms compete, the question of how such changes affect **non European firms seeking opportunities within the market** still remains. While the details of the responses of those interviewed was somewhat mixed, the overall consensus was that the market for a firm coming from the U.S. or Japan is still very competitive and that the Single Market oriented initiatives themselves have done little to either support or deny opportunities for such firms in general.

Foremost on the minds of those considering entry should be the awareness that the European market is extremely competitive and that the market is filled with competent firms that are willing to work for exceptionally narrow margins of profit. Although the market's initiatives have made many aspects of business easier and more streamlined - which should only increase with time - this in no way implies that conducting business within Union is now easier or more efficient than conducting business elsewhere outside of the Union.

Indeed, many of the issues already covered which influence the decisions and actions of a European firm contemplating an intra-EU shift in markets would seem to apply to a U.S. or Japanese firm considering entry into Europe. Clearly, those tactics applicable to European firms seeking market entry - such as the formation of partnerships with or the acquisition of indigenous established firms, or the marketing of a product or service that provides significant value added not provided by a competitor - likewise are applicable to outside firms seeking entry.

U.S. firms within the construction industry, unlike their counterparts within other industries such as telecommunications, computers, software, or movie/entertainment, possess no one clear advantage, at least not of the same magnitude offered in these other

industries, over their European competitors. This condition alone acts to dissuade the many U.S. firms from even considering entry. Competitive advantages for such firms will likely not lie directly "within" the delivered product, but rather through the processes and procedures (means of financing and delivery, for example) that contribute both directly and indirectly to the product. As the European market adopts and takes on many of the characteristics and appearances of the U.S. market, U.S. firms should be ever cognizant of competitive advantages afforded them, having already succeeded within such a market, but not yet possessed by their European competitors.

The opinion of Mr. Mondini concerning the advantage afforded to U.S. firms - relative to their Italian counterparts - through savings derived from lower insurance rates appears to lend credit to this notion.[295] According to Mr. Mondini, one other way in which some U.S. firms may possess an inherent advantage over some Italian firms lies in the manner in which firms have structured their functions to meet the responsibilities imposed upon them by the traditional relationship between client, architect and builder. A recent trend in Italy, where the accepted norm for larger projects was to have the same firm that designed the project also build it (design-build), has been to bid separately the design and construction portions of larger public works projects. Mr. Mondini's opinion is that U.S. firms, already accustomed and conditioned to working as either designers or builders, may possess a competitive advantage in that they employ specific processes and procedures (for example, communications and coordination skills) not possessed by their Italian competitors. This advantage may, however, be short-lived as more and more Italian firms adapt their firms to meet these changes.

[295]For additional information please refer to Section 4.1.

Another manner in which U.S. business interests may benefit though has less to do with the Single Market directly but rather more to do with the intensifying globalization of firms. Within the structure and the operations provided by a common parent element, U.S. subsidiaries within some sectors are able to provide products and services to fellow sister organizations/elements operating within Europe. Such relationships can clearly serve to benefit U.S.-based suppliers of materials, products and supplies.

It was such a relationship that enabled a German firm to compete for and acquire several power plant projects within the eastern region of Germany. Through its U.S. affiliate, who had already established and benefited from a link with a U.S. producer of turbines, the parent organization in Germany acquired not only the turbines but the proven technical know-how to efficiently incorporate them into the projects' design. In this specific example it is the supplier of turbines that derived the greatest benefit from this relationship. It is very likely that U.S. providers of other construction-related services and products will benefit in similar ways as the globalization of firms continues.

4.3 Barriers Unaffected by the Single Market Initiative

Although the market's impact in certain respects is most visible on the export of construction related *services* within certain sectors of the construction industry--namely public works, it is the opinion of most individuals interviewed that barriers still exist which preclude the market from being transparent.[296] These barriers--which act to limit certain markets to indigenous firms--will likely remain untouched by the barrier-reducing policies of the Single Market.

[296]Primarily those projects tendered by public authorities.

An opinion shared by many of those interviewed is that regardless of how transparent past and future policies attempt to make the borders between markets, *the combined effect of remaining differences at the national and regional levels--some which can never be truly affected through policy--will continue to act so as to discourage intra-Union activity and the merging of markets.*

The myriad of **procedural actions** required of all firms, whether in competing for contracts or taking the necessary measures within the various phases of construction, will to a large extent continue to remain unique by member state or region, serving to inhibit intra-EU commerce and business. This is evident in that many aspects concerning the policies and procedures in the areas of permitting and approval will no doubt, by necessity, continue to be determined at the local and national levels. This in turn provides an inherent advantage to those firms already established within the market.[297]

Building codes, even after "harmonization," must still account for differences in preferred **style and design**, which can be and are quite extensive. Differences in style serve as a hindrance to market unification and will be more noticeable in those markets that style plays an important role - such as within certain sectors of the housing industry - whereas less noticeable in other markets such as infrastructure and civil works.[298] In many instances the merging of markets between regions of different member states particularly of those sharing like borders will be more extensive and pronounced than the merging of markets between regions of the same member state. For example, a firm specializing in Alpine style homes design and construction from southern Germany would more likely succeed within the home design and construction market of northern Italy than within the coastal region of northern Germany. The firm's success would be attributed largely to similar tastes in style

[297]Sources 82 & 85.
[298]Source 89.

and design (product proximity) and, perhaps to a lesser extent, the location of markets (geographic proximity).

Perhaps most noticeable by firms attempting to gain a foothold within another member state's market is the feeling that the **selection process is not completely fair**; one that does not create a level playing field for all competitors. Although there are very real differences in the manner in which contracts within the public and private sectors are both tendered and awarded, clients within both sectors are still able to exercise considerable discretion that ultimately determines who is awarded a given contract. All individuals consulted felt that this factor alone was the toughest one to tackle in attempting make a market with transparent borders and that, to some extent, it always would exist; particularly in the private sector.[299]

According to Mr. deAngelis, private clients are "absolutely protected" from the market-related legislation that attempts to unify contracting within the public sector. As such, they can use their discretion in who they consider and ultimately select to employ to execute a contract. In his opinion, those projects that are tendered are often awarded based on very poorly defined, difficult to measure criteria such as "the one who builds best rather than the one who builds for the lowest cost."[300] Not surprising, such subjective criteria make it difficult, if not impossible, of new comers to acquire work within many of the Union's private sector markets.

In competing for public contracts within other member states' markets, the difficult hurdle to cross - the one in which the client can exercise the greatest amount of discretion - is in meeting the criteria contained in the short list prequalification. Once having "made the

[299]Sources 88 through 85.
[300]Source 82.

cut" and having received an invitation to bid, the selection process is fairly straight-forward with cost being the primary factor in contract award. The mandatory disclosure of bid results, unique to public projects, further serves to make the process as impartial as possible.[301] The trend within the Union to privatize state-owned entities is acting to decrease the amount of public sector work, while simultaneously increasing the amount of private sector work; an added factor to consider for those firms that are either in, or contemplating entry into, this sector.[302]

No doubt the most "natural" barrier of all, and yet the one most often taken for granted and overlooked, although in retrospect self evident, is that of **language**. All individuals consulted saw the ability of a firm to effectively deal in the native language of another member state's market as playing a vital role in gaining access into and succeeding within another market.[303] All correspondence and documentation concerning contracts within both the public and private sectors are typically done only in the native country's language. In order for a firm from elsewhere to be considered as a *potential* awardee for a contract it requires a considerable investment in both time and money, the extent of which is often not fully known at the venture's onset.

The sentiment of those consulted regarding the importance of language in conducting business is particularly telling in light of a recent announcement made by the forces of the French prime minister, Mr. Edouard Balladur. A bill which he intends to sponsor would "require all private businesses in France to conduct their operations in French." As written, violations of this legislation "could result in monetary fines and even incarceration."[304] The burdens that such legislation would impose upon business are fairly

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[301]Source 82.
[302]Source 82.
[303]Sources 89 through 85.
[304]Source 71.

predictable and self evident. What is most revealing is the protective environment within this member state - hardly conducive to intra-EU commerce and business - that allows such measures to be borne and, perhaps, passed into legislation. While it may not be fair to conclude that such a measure is indicative of the attitudes within all member states - or even the prevailing attitude within France - it is nonetheless revealing and pertinent in any discussion addressing remaining barriers within the EU.

As can be inferred from the above example, the closer Union member states are pulled together through pieces of legislation that are intended to have a unifying effect on the Union, the more indigenous populations are displaying an attitude that can only be described as "increasingly isolationist." A recent EU law enables foreigners to vote for representatives in the European Parliament, whereas another piece of legislation goes so far as to enable them to vote in local elections. With the implementation of such legislation at the member state and local levels, so also appears a distinct undercurrent that tends to have a mitigating effect on unifying measures. While the increasingly isolationist attitude is most apparent in the smallest member state - Luxembourg, where 30% of the total population, indeed more than 50% of the workforce, is foreign - this "dilemma will probably reach other member states as national borders disappear."[305] According to Dana Milbank of the Wall Street Journal, "with language and cultural barriers European countries may find assimilation daunting."[306]

4.4 Summary

It is evident that the manner in which business is conducted within Europe is changing as a result of the European Union's Single Market initiative. While the policy and legislation at the Union level does not appear to have as great an impact on the construction industry as it

[305]Source 36.
[306]Source 31.

does on other industries, the fact remains that very real changes are occurring which ultimately affect both the product and the process of construction throughout Europe. Perhaps now, more so than ever, is the future success of a firm firmly rooted in its ability to adapt both its strategies and tactics to the new conditions brought about by the changes occurring within the market.

Although not all changes occurring within the Europe's market places can be attributed to the advent of the Single Market, it nonetheless is insightful to ascertain the impact of market-related changes in light of these other variables which affect the market's current character. These variables include such factors as the recessive state of most member states' economies; the capitulation of communism in Eastern Europe and the shift of former Warsaw Pact countries away from centrally planned economies toward free market economies; the fragmented state of the construction industry in terms of firm size and industry sector focus; and the Single Market's relative youth in light of the ongoing development of policy & legislation vital to its being.

Whereas it is the larger firms that were likely internationally focused prior to the market's advent that in particular are affected by the Single Market, smaller firms also feel its impact. Smaller firms in border regions are affected by intensifying cross border activity and smaller firms in general are increasingly coping through the formulation of new relationships, whether for a limited duration or permanently (acquisition).

It is also apparent that the construction process in the public sector, primarily through mandated changes in how contracts are administered and tendered, is more affected than that in the private sector. Sweeping changes in areas such as financing, insurance and bonding are, however, affecting those processes inherent to both the private and public

sectors. Such changes are enabling firms to explore new markets that in the past may have been regarded as either too cumbersome or non profitable (or both) to pursue.

Today, perhaps even more so than ever before, the intensity of competitive rivalry throughout the Union dictates that those firms going abroad possess a specialty, enabling them to provide significant value added compared to that provided by competitors. This tenet perhaps applies even more so to firms from other markets around the world that are contemplating possible entry into the Single Market. Such firm's may best be able to benefit indirectly from the Single Market by providing products and services through channels forged and already operating within the market.

4.5 Conclusions

Several conclusions about the Single Market's impact on the European construction industry can be drawn from the information presented in this thesis. These conclusions are appropriately grouped and presented under the two primary headings of present & potential impact and effects on the cost, quality, and time of construction.[307]

4.5.1 Present & Potential Impact

The years surrounding the market's opening on January 1, 1993 have witnessed several changes which have had - and will continue to have - a positive impact on the construction industry. The conclusions stated in this section serve to merge the many ways in which the industry is - and will be - impacted.

[307]The point at which a potential impact becomes a current impact is

Union and national officials have committed significant resources toward improvements in European infrastructures - most notably transportation - which is generating construction activity throughout Europe. This is evidenced by the $22 billion committed by the European Commission to be spent annually through 1999. Investment in infrastructure will increase in upcoming years as Europe pulls itself out of its worst economic slump since the Second World War and more European countries commit to joining the European Union.

The industry will increasingly lean on European level programs for research and development support as traditional sources of funds diminish - primarily national and organic programs - and as representative bodies, such as the European Construction Industry Federation (FIEC), intensify their efforts. Members within the industry stand to benefit from research and development conducted through the Union-sponsored program - Framework - and the program sponsored by greater Europe - EUREKA. The construction sector's interaction with both programs to date has been negligible, despite the existence of both programs for almost a decade.

The market's advent has increased the prominence of the industry's representative federation, the FIEC. The FIEC is poised to play an increasingly visible role by coalescing the needs and views of the member state representative bodies and affecting policy and programs formulated at the Union level which in turn impact the construction industry.

The adoption of certified quality systems within construction firms will continue - along with an increasingly demanding clientele that expect such systems to be in place - giving firms adopting such systems a distinct competitive advantage abroad as well as within Europe. The expectations of clients that such systems exist in those firms they hire, having

started in the public sector and now becoming more pervasive in the private sector, serves as a barrier to firms from without the Union that have failed to adopt such systems.

Policy and legislation which standardizes the processes and products of construction impacts the industry in a number of positive ways. The standardization of public tendering procedures enables some firms to conduct business in as yet untried markets. The standardization of building codes will have a similar positive effect, especially for those firms focused on public sector work. Opportunities in the public sector are to some extent mitigated, however, as a result of the growing tendency to place public agency work into the hands of the private sector. Firms will be abler to benefit from economies of scale realized through bulk purchases of products and materials.

The market's impact is felt most directly by larger construction firms. The combined effects of operating within a freer, more competitive market serves to sharpen the international competitiveness of European construction companies. Many of the changes affecting the construction process apply only to work tendered in the public sector, a sector occupied primarily by larger firms. Larger firms also are in a better position to reap benefits resulting from the reduction in barriers to the intra-Union flow of goods, services, capital and labor. The market's impact on smaller firms has largely been limited to those operating in border areas and those that can derive or provide benefits through partnerships. *The presence of many of the potential benefits offered by the Single Market - stymied by the current recession - will become increasingly evident as the economic health of Europe improves and more Union policy is enacted into law at the member state level.*

Significant issues and forces remain which act to mitigate the Single Market's potential positive impact on the construction industry. Some are the result of not yet addressed

market-related issues, whereas others fall outside the Single Market's range of control and influence.

Europe's longest and severest recession since the Second World War coupled with the presence of financially-strapped national governments has greatly contributed a lack of growth throughout Europe within the sector. The lack of a single monetary unit in Europe has served to limit beneficial cross border investment and activity. The extensive involvement of and meddling by state authorities with the private sector often counter-acts potential free market gains. Growth within the private sector - upon which the construction sector is largely dependent - has been made even more difficult to achieve because of the burden placed on it in financing the extensive net of social and employment benefits enjoyed by Europeans.

Within the construction sector itself, other factors act to further stymie the merging of markets. Stark differences in language, the preference of buyers, contracting procedures and requirements - particularly in the private sector - still exist. Many of these differences will remain long after the Single Market's introduction, presenting challenges to any firm desiring to expand into or within the market.

4.5.2 Effects on the Cost, Quality and Time of Construction

The changes taking place within the European construction industry as a result of those issues discussed in the prior section will ultimately affect the factors of cost, quality and the time associated with construction. The manner in which these factors will be altered by the changes occurring within Europe are highlighted in this section.

The net effects of forces will serve to lower the overall ***costs*** *associated with construction.* Firms, now able to acquire funds at more competitive rates are able to pass such savings on

to clients. Savings derived by firms through the availability of more competitive insurance and bonding rates also can be passed on to clients. The continuing pursuit of new mechanisms through which projects can be financed can also result in savings that can be passed on to clients. The increase in the number of firms competing for a project, made possible because of the reduction of intra-Union barriers, also serves to drive the cost of a project downward. The reduction in these barriers also enables firms to realize savings in the costs of materials and supplies made possible by the increasing competitiveness amongst suppliers.

Countries and regions whose employment costs are high relative to others will be increasingly forced to seek ways which reduce or mitigate[308] the relative difference in costs. Although the construction costs will be lowered in both the private and public sectors, the difference will be most cogent in the public sector. Firms operating within the private sector are impacted less by Union-mandated policy that serves to increase the size of the pool of those competing for a project and may be more discriminating in the selection process. Growth within the private sector resulting from the privatization of heretofore public agencies will serve to reduce the amount of public work that, were it not for privatization, would have been available.

The net effects of the forces will serve to increase the overall ***quality*** *of construction.* The increase in quality, however, will be neither as prominent nor as fast coming as is the lowering of costs, as the assessment of quality is highly subjective and the implementation of changes which improve it tend to require more time and money. For these reasons, firms competing within most segments of the construction industry are more apt to allow quality to "reasonably" suffer, if doing so provides a significant advantage in costs.

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[308]Applying methodologies and/or technologies which provide significant value added - while having little/no net impact on employment costs - is one way such firms can become more competitive.

The bargaining strength that clients can wield over competing construction firms - as already commented on - will manifest itself in demands of higher quality being placed on construction firms. The increasing trend of firms joining together in partnerships also potentially results in greater quality of construction, as combining firms often bring a specialty - or core competency - into the relationship. The movement towards certified quality assurance systems will contribute to improved efficiencies in construction, which in turn will contribute to greater overall quality of construction. The movement to standardize construction products and building codes will contribute to the overall reliability and performance - quality - of end products in the short term but could have an altogether different effect in the long term. Once mandated construction product specifications are in place - specifications which contain both performance and prescriptive portions - producers may find the risks and costs associated with developing and marketing new products not worth the potential benefits. Furthermore, mandated product and building standards could potentially act to stymie innovation by being too restrictive, in turn dampening the long term trend in improved quality.

The net effects of the forces will serve to decrease the overall ***time*** *of construction.* As is the case with quality, the factor of time competes directly with the factor of costs in a construction project. In many instances, an attempt to reduce the time associated with a construction project is mirrored by a corresponding increase in construction costs, assuming the financial incentives for reducing the time are not greater than the additional costs incurred. Similarly, increasing the time of construction often results in incurring additional costs, often stemming from both continued construction activity and resulting penalties. The factor of quality also competes with time but is also easier to control, especially if one is willing to forego incurring additional costs. Ideally, one seeks ways of reducing the time associated with the process of construction without incurring additional costs or negatively affecting quality.

The freer, faster movement of capital, goods and services enables firms to be more responsive to time-related demands placed on them by clients. The standardization of many procedures associated with the tendering and award of public contracts will similarly reduce the overall time required by the construction process. The larger pool of firms competing for a project allows those firms whose methods and processes contribute to a reduction in the time required by the construction process to succeed, enabling their methods and processes to influence the establishment of new industry standards. The increase in partnerships arising between firms with distinct core competencies further enables firms to reduce the time associated with construction. Lastly, the standardization of products and building codes - once enacted - should enable further savings in time to be incurred in those projects that they affect, although such savings are likely to not be as pronounced as those already addressed.

The cumulative effect of the changes occurring within the European construction market is causing business to become increasingly competitive. This increase in competitiveness throughout the industry in turn pushes the factors of cost, quality and time of construction to the forefront of concerns addressed by firms operating within the market. Those firms that are most capable of balancing these three, internally-competing and mitigating factors - while driving each individual factor in the desired direction[309] - will stand the greatest chances of succeeding in the Single Market. An understanding of the forces that affect these factors is both fundamental and essential to being able to positively influence them to a firm's benefit.

[309]Costs downward, quality upward and time of construction downward.

Appendix 1, Industry Structural Analysis

Introduction

This appendix consists of an extract of a report[310] which examines the competitive environment of the construction industry within the European Union (EU). Specifically, it assesses the industry within the context of the Single Market initiative, unmistakably one of the boldest attempts to improve the flow and content of trade within any region of the world; in this case Europe, which historically is one of the most obstacle-ridden marketplaces of the world. The report explores the extent and nature of the impact of the world's largest free-trade zone on the competitive forces that influence the strategies of those firms operating within its construction industry.

The report's keystone is an analysis which assesses the competitive environment within the EU's construction industry. The method chosen for the analysis, referred to as Porter's Industry Structural Analysis,[311] enables one to view and weigh the impact of all forces which affect the competitive postures of firms operating within an industry.

1.0 Porter's Industry Structural Analysis

The Industry Structural Analysis provides a thorough means of determining the competitive lay of the land within any industry's field of play. Central to the analysis is an understanding that competition, or perhaps more directly how a firm seeks to gain the upper hand to attain and maintain a profitable position, is not merely the result of responding to what other competitors in the industry are doing; but rather results from responding to the effect on the firm of five distinct forces relative to the firm's position. The five forces assessed in

[310]As such, certain portions of this appendix are redundant with the main body of the thesis.
[311]For more information refer to Competitive Advantage by Michael Porter (Free Press, 1985).

the analysis are (1) the bargaining power of buyers, (2) the bargaining power of suppliers, (3) the threat of new entrants, (4) the threat of substitute products and (5) the rivalry among existing firms.

Certain parameters must be established in order to make the analysis possible. The industry being analyzed must be defined and in the context of this paper is that of general contractors who rely primarily on construction activity within the EU for their business. The time period during which the industry is being looked at must also be determined and in this case is the mid 1990's, say between the years 1993 and 1997. Not establishing these parameters would preclude one's ability to effectively assess the impact of those forces which affect the strategies of firms operating within the EU's construction industry. It is now necessary to address the EU and its Single Market initiative, as this assists by setting the stage upon which the construction industry's competitive environment can be addressed.

2.0 An Analysis of the Competitive Forces within the EU's Construction Industry

It should be pointed out that within the context of the Single Market initiative, most of the factors that affect the strength of the five forces ultimately stem from government policy at the EU level *since the initiative itself is driven by government policy*. However, rather than simply stating that "government policy is the factor influencing the strength of the force," the assessment probes deeper, attempting to identify those *intermediary factors* affected by government policy *which in turn affect the forces' strengths*.

2.1 Assessment of the Bargaining Power of Buyers

The bargaining power of buyers is assessed as being strong. The main factor which contributes to increased buyer strength is the larger pool of contractors that clients may "choose" from, resulting primarily from the weak economy, an EU directive requiring public works projects above a certain dollar amount to be advertised EU-wide and the

agreement between the EU and EFTA to make each other's markets accessible to one another. The integration and unification of financial markets throughout the EU coupled with the movement by many governments to use privatization as a means of funding & executing projects also leads to increased buyer power.

The anemic condition of the EU's economy has resulted in reduced investment in both the private and public sectors. The EU's GDP during 1993 is forecast to decline, its first decline since the peak of the oil crisis in 1974,[312] by .5% and increase only a meager 1.25% in 1994. The EU's jobless rate fares no better at 11% in 1993 (21.3 % in Spain, 15.2 % in eastern Germany, 11.0 % in France and 7.5 % in western Germany)[313] and is estimated to top 12% during 1994.[314] Most forecasters agree that the GDP of the EU and its member states will for the most part improve in the years following 1994, but this improvement will likely be slow and incremental. Buyers are therefore able to use to their advantage the over-abundance of firms competing for a limited number of contracts, enabling them to receive the absolute most for the amount invested. Of course within certain regions of the EU, eastern Germany to name one, this may not hold as the nation's reunification has provided "fuel" to a construction market that would otherwise be less active.

A directive passed by the EU's Commission acts to add to the size of the pool of potential contractors competing for a contract, yet further increasing buyer power. The directive requires that all public works contracts in excess of $6 million and all public works design contracts in excess of $.244 million, be advertised EU-wide prior to considering potential candidates.[315] Despite the directive's existence at the EU level it will likely be some time before its *full force* is felt, as bureaucracy and nationalism are certain to slow its passage and

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[312]Source 44.
[313]Data is for July and August 1993.
[314]Source 24.
[315]Source 41.

subsequent implementation at the member state level. It is estimated that 60% of all eligible projects in Italy are not advertised within the EU and that in Italy alone it could take up to five years to fully implement and enforce the directive. Aggrieved contractors do have some recourse though in that they may either sue the client or ask the EU to intervene with the national government, a route full of complex, dissuading bureaucratic hurdles which ultimately leads to the European Court of Justice (only 25% of all such cases to date have reached the court).[316]

The combination of the integration and unification of the banking, securities and insurance sectors *with* the growing trend of funding public works projects through privatization will ultimately contribute to increased buyer power. The integration and unification of the financial services markets, being made possible through the passage of over 20 directives by the EU Commission and scheduled to be completely in place not later than 1995,[317] will provide contractors with a much wider range of options to fund projects (including bonding & insurance). Opportunities provided to those contractors willing to enter the privatization market exist and appear to be growing and are perhaps best exemplified by an ongoing effort within Germany, Italy and the United Kingdom to privatize major portions of their road and rail networks.[318]

The bids submitted by the pool of contractors vying for a particular privatization contract would likely reflect the wider range of finance options available in that bid prices would likely be both lower *and* more dispersed. Buyers, in this case the public sector, are then able to reap those benefits provided by the financial markets' integration to the contractors

[316]Source 41.
[317]Source 16.
[318]Source 40.

by selecting that firm whose services provide the greatest value for the amount invested. This situation also contributes to the intensity of the rivalry among existing firms.

2.2 Assessment of the Bargaining Power of Suppliers

The bargaining power of suppliers is assessed as being moderate. The same reasons that enable the buyers within the industry to wield their strength over the contractors (who in this case *are* the suppliers) to a large extent also enable the contractors to wield their strength over *their* suppliers. Two factors, though, that will provide some suppliers with strength over buyers result from the ongoing attempt within the EU to standardize its construction products and the freer flow of goods, labor and professional services across intra-EU borders.

Like the construction industry, the construction products industry-- not surprisingly--is also quite regionalized. Most building materials are used in their countries of origin and do not move intra-EU. However, an EU directive which has been law since 1991 should in the upcoming years act to dissolve the geographic boundaries that exist between construction products markets. The directive establishes procedures by which manufacturers can attach to their products the "CE" mark, a seal verifying that the product meets all applicable EU mandated fitness and performance requirements.[319] Full implementation of the directive is being slowed while the interpretive documents, explaining how the essential requirements of the directives can be met, are developed.

Those suppliers that either are already manufacturing products very close to or fully in compliance with the standards being adopted or are among the earliest to convert their

[319]Fitness criteria include mechanical resistance and stability; safety in the case of fire, hygiene, health and the environment; safety in use and protection against noise; energy economy; and heat retention. Performance criteria include meeting the expected working life of the product a meeting a variety of geographic and climatic demands. Refer to Source 45 for additional information.

production processes/lines over to meet the new standards, will be able to attach premiums to the prices of their products due to the "limited supply" of such products. The added element that goods now flow more freely across intra-EU borders will furthermore give some suppliers the advantage of exploiting markets with products that had been, for reasons any number of reasons, restricted (cost, customs controls, etc.).[320] This form of supplier power will however likely be short-lived, if not non-existent for some products which are or approach being a commodity, as more and more suppliers conform their products to the new standards (as the supplies of such products increase their prices will tend to decrease).

The freer movement of labor and professional services, made possible through an EU level directive that requires member states to acknowledge for employment & legal purposes those individuals who were qualified within other member states, will enable certain suppliers of professional services (and labor to some extent) to wield increased power over their buyers. Those suppliers of such services and labor may demand a premium from their buyers for providing something that the local suppliers within the market cannot. The strength of their power will, however, with time diminish as more suppliers adapt themselves to meet the demand.

2.3 Assessment of the Threat of New Entrants

The threat of new entrants is assessed as being strong. While the threat posed at national and/or regional level markets by firms that have traditionally operated elsewhere within the EU is very real, the threat posed by those entering markets from outside the EU is mitigated--at least in part--by protective legislation recently enacted by the EU's Council.

[320]The freer flow of goods is addressed in greater detail in section 2.4 of this paper.

The legislation enables public clients to favor bids submitted by European (EU) contractors over contractors from outside the EU by flat-out rejecting bids from firms with greater than 50% non-European content *or* assigning a 3% bid price advantage to European bids.[321] This legislation very clearly gives EU firms a decided advantage over firms, say for example those from the U.S. or Japan, desiring to enter the EU on their own. While this law does not apply to projects arising within the private sector, the reality that private clients for the most part are more apt to favor a well reputed contractor from Europe--if not their own country--over one from the U.S. or Japan, further acts as a barrier for new entrants to the market.

The threat of new entrants posed by firms that have traditionally operated from elsewhere within Europe, however, is quite strong. The anemic state of the economy, which has contributed to the over supply of construction assets relative to the current demand for such assets, is forcing contractors abroad and into other regions of the EU. Such contractors may attempt to enter other regional markets within the EU on their own, but are more likely to develop some kind of partnership/joint venture with a local firm that is already well established in the area.

Of course those firms that specialize in a field whose demand is currently not satisfied by indigenous firms will likely find themselves possessing a decided advantage when penetrating new markets, making them less reliant on joint ventures as a means of entering new markets. The threat of new entrants is likewise increased as a result of the public works advertisement directive (discussed in the prior section). More firms from other member states in the EU are likely to compete for a given contract due to the increased awareness of such jobs.

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[321]Source 17.

2.4 Assessment of the Threat of Substitute Products[322]

The threat from substitute products is assessed as being moderate. Although the freer flow of goods across borders may act in the short term to enable certain products not yet produced within certain member states to enter from other member states, the movement to strictly regulate and standardize construction products throughout the EU will ultimately act to reduce the strength of this force. The freer movement of labor and professional services throughout the EU, combined with the forces at work within a free market economy, will permit those processes and services that offer greater value/efficiency to displace existing ones, serving to increase the threat of substitute products. This threat will only intensify as the EU and EFTA open their markets to one another in the upcoming years.

In recent years national regulations limiting the free movement of goods have gradually disappeared, permitting freight movement by roads to grow relatively unhampered. Quantitative restrictions on goods transported between member states has been eliminated as of January 1993, and the Community has issued authorizations enabling road haulers "who are nationals of one member state to carry goods anywhere within the EU."[323] Customs border controls (between member states' borders) have been practically abolished with stops now limited solely to legal matters such as checking for drug trafficking and illegal immigration. Those contractors that are able to acquire and put to use construction products or processes, that before were either restricted or cost prohibitive to use, may in the short run achieve a competitive advantage.

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[322]Products in the context of this paper are considered not only to be construction products but also include the processes and services that contribute to the industry.
[323]Source 17.

The freer movement of labor and services will likely have a stronger, longer lasting impact on the overall strength of the threat provided by substitute products than that provided by construction products. Individuals employed in countries other than those in which they were trained or qualified will take with them those ideas and processes that they acquired in their country of origin. In those cases where the "imported" processes (substitute) or services offer a firm a decided competitive advantage over the existing ones they will prevail by replacing the existing processes or services. The freer movement of labor and professional services throughout the EU will serve to permit those suppliers with processes and services that offer greater value/efficiency to achieve a competitive advantage. The threat due to this force will likely last longer than that resulting from construction products because professional services and labor, when viewed as a product, will not be "homogenized" to the extent that construction products will be through the implementation of strict standards of conformance.

2.5 Assessment of Rivalry Among Existing Firms

The rivalry among existing firms is assessed as being strong. The main factors that contribute to the high degree of rivalry are the anemic state of the European economy, the increasing rate at which competitors are diversifying and, to some extent, the lack of differentiation and switching costs currently in place throughout the industry. The merging of the EU's and EFTA's markets will serve to only intensify this threat in the upcoming years.

The recessive state of the European economy essentially means that more firms are competing for less available work. As a result, firms will be more willing to take extreme measures (price competition, services competition, etc.) to acquire that work which is available, providing yet more fuel for the rivalry "fire."

The ability for existing firms to diversify their services & products by taking advantage of the benefits provided by EU level directives that impact the construction market (integration & unification of the financial services markets; freer flow of goods, labor and professional services, etc.) also contributes to an increase in the rivalry between existing firms. Firms can employ new methods--most likely related to prices or services--in an attempt to out-position or out maneuver competitors. Competitors are forced into taking similar measures, resulting in an escalation of competitive actions & measures taken by both sides. Such behavior is typical of an environment in which there is intense rivalry.

Those segments of the industry that provide *close to commodity products & services* (ie. lack of differentiation & switching costs)--which comprises a significant portion of the total of general contractors--by their nature operate within an environment in which the rivalry among existing firms is high. Firms in such industries are forced to use either price or service competition in an attempt to achieve and maintain customer loyalty. As is also the case in the U.S., this factor in the EU contributes in a like manner to an increase in the rivalry among existing firms within the construction industry.

3.0 Conclusions & Comments

The implementation of the EU's Single Market initiative is clearly affecting the competitive environment of its construction industry, as the results of the industry structural analysis, outlined below in Table A-1, indicate. In order to determine whether the strength of each force is increasing or decreasing as a result of the Single Market initiative a detailed analysis of each force under those conditions that existed prior to the initiative would have to be conducted and then the results compared with those obtained in this analysis. This analysis therefore does not allow one to conclude that the strength of a particular force has either increased or decreased as a result of the initiative but rather only to determine the manner

in which the initiative impacts each force. The strongest of these forces--the bargaining power of buyers, the threat of new entrants and the rivalry among existing firms--are also the most influential in affecting those actions firms will take in an attempt to not only attain but sustain a competitive advantage. The other two forces, in general, should act to influence firms' competitive strategies to a lesser degree.

Force & Relevant Factors	**Strength of Force & Effect on Force**
Bargaining Power of Buyers	**Strong**
-Condition of the Economy (intermittent over capacity)	-Increases buyer power
-Advertisement of Public Works Contracts Directive*	-Increases buyer power
-Financial Services Integration & Unification* & Privatization	-Increases buyer power
-Merging of EU and EFTA	-Increases buyer power
Bargaining Power of Suppliers	**Moderate (since short-run increase)**
-Standardization of Construction Products Directives*	-Increases supplier power *in short-run*
-Freer flow of Goods, Labor and Professional Services	-Increases supplier power *in short-run*
Threat of New Entrants	**Strong**
-Advertisement of Public Works Contracts Directive*	-Increases the threat of entrants (Intra-EU)
-Forging of Intra-EU Partnerships & Joint Ventures	-Increases the threat of entrants (Intra-EU)
-Protective Tender Policy (EU preference on tenders)*	-Decreases the threat of entrants (Inter-EU)
Threat of Substitute Products	**Moderate**
-Intra-EU Customs Barrier Removal (freer flow of goods)*	-Increases the threat of substitute products
-Standardization of Construction Products Directives*	-Decreases the threat of substitute products
-Freer flow of Labor and Professional Services	-Increases threat of sub processes & services
-Merging of EU and EFTA	-Increases threat of sub prod, proc & services
Rivalry Among Existing Firms	**Strong**
-Condition of the Economy (intermittent over capacity)	-Increases the rivalry among firms
-Diversity of Competitors	-Increases the rivalry among firms
-Lack of Differentiation & Switching Costs	-Increases the rivalry among firms

*Factors that result from government policy

Table A-1. The Five Forces & Relevant Factors Affecting Competition among General Contractors within the EU's Construction Industry

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