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Managing multinational infrastructure: An analysis of European Union institutional structures and best practice

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ADB Working Paper Series

Managing Multinational
Infrastructure: An Analysis of
European Union Institutional
Structures and Best Practice

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Jorge Núñez-Ferrer

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Abstract

Creating the framework for cross-border infrastructure cooperation often requires the active role of a third party, an “honest broker”, to forge convergence of interests. It is often argued that “deep” European Union (EU)-style integration is a necessary, though not sufficient, condition for successful cross-border infrastructural cooperation. The EU institutions, in particular the European Commission and the European Investment Bank (EIB), have performed such a facilitating and enabling role, though not without encountering challenges along the way. However, this paper argues that the EU experience underscores the vital importance of national governments and good governance in the context of cross-border multinational infrastructure. Hence, the authors argue that “deep” EU-style integration is an enabling but not a strictly necessary condition for successful implementation of cross-border infrastructure projects. The authors take issue with the myth that transnational cross-border infrastructure cooperation is the result of supra-national decision-making at the EU level.

For a particular cross-border infrastructure project to succeed requires tri-partite and multilateral initiatives. These may take the form of “coordinators” (akin to the European Coordinators for TEN-T projects) or special-purpose state-owned companies alongside the Asian (and/or other) Development Banks as co-owners.

The second myth which this paper seeks to address is that the management of transnational and cross-border infrastructure is primarily supra-national. Although additional co-financing may be sought from the European Community budget and/or the European Investment Bank, these resources always complement national budgetary allocations and private funding. Contingent liabilities always remain at the national and sub-national levels and never at the supra-national EU level.

The implications for management of cross-border multinational infrastructure in Asia, where the framework for regional cooperation is not yet well articulated, are to some extent positive. Within the Asian context, the need for an honest broker can be fulfilled by multi-lateral institutions such as the Asian Development Bank and the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP). They can appoint “coordinators” drawing on the growing pool of top-level decision makers in Asia. Most importantly, these initiatives can be realized within the present-day context of Asia’s “shallow” integration.

JEL Classification: F36, H54, O19

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1. INTRODUCTION

The European Union (EU) has accumulated much of its power in an ad hoc and pragmatic way. This pragmatism was found in the earliest statements by one of its founders, Jean Monnet, who famously argued that the “union between individuals or communities is not natural; it can only be the result of an intellectual process ... having as a starting point ... the need for change. Its driving force must be the common interests between individuals or communities”. This “neo-functionalist” thinking prompted the well-known Schuman declaration that “Europe ... will be built through concrete achievements which first create a de facto solidarity”. In the words of Moussis, a long term observer of European integration, the neo-functionalist assumptions have “proved correct by European experience”.¹

This pragmatic way of proceeding has also characterized the distribution of functions in economic integration between different types of actors with different levels of competence and authority. As Molle has argued, “neither the optimum mix of union and national measures nor the areas where further integration will be most beneficial can be determined *a priori* on theoretical grounds”.²

For our investigation, these theoretical perspectives imply that the path of integration that may be followed in Asia (and elsewhere), and in particular the role of cross-border infrastructure may differ fundamentally from the European experience. This discussion paper will argue that the creation of cross-border infrastructure can be realized with a limited number of specific process and project innovations, facilitating regional cooperation and the capturing of positive spill-over effects from this. These do not necessarily require the deep integration which characterizes the European Union today.

2. THE EVOLUTION OF MULTINATIONAL INFRASTRUCTURE IN THE EU’S HISTORY

2.1 Origins and Priorities of the EU

Multinational infrastructure and Trans-European Networks are late entrants to the kaleidoscope of the EU’s common policymaking and implementation. One of the earliest concerns of the European Community, once the basic issues of security and stability had been addressed, was the need of a structural development of the agricultural sector. As will be demonstrated below, infrastructure is only a relatively recent addition to the EU’s work programs and responds to specific demands to underpin the single and integrated European market.

The origins of the EU can be traced to three different organizations established under the first European Treaty establishing the European Coal and Steel Community (ECSC) in 1951 and the Treaties of Rome in 1957 establishing the European Economic Community (EEC) and the European Atomic Energy Community (EAEC commonly known as EURATOM). These three organizations formed the European Communities, as the institution was called since the Merger Treaty of 8 April 1965 which established a single Council and a single Commission with effect from 1 July

¹ See Moussis 2007, p.7.

² Molle 1994, p. 23.

1967. These were merged into a single body, the European Union, with the ratification of the Maastricht Treaty in 1992.³

The main purpose of the ECSC in 1952 had been the avoidance of military conflict by putting under joint management the coal and steel resources under the ECSC.⁴ In 1957 the EEC and the EURATOM were founded, with the EEC having a broader mandate to develop a Common Market in Europe.

The creation of these bodies followed the need to find a successor to the Organization for European Economic Cooperation (OEEC) which coordinated the Marshall plan after the Second World War. The OEEC had been established in 1948 and sponsored by the United States, which invested \$17 billion in the reconstruction of Europe over four years. Hence, the ECSC was created in the same year the OEEC ceased its operations. The hallmark of the ECSC was specific and focused functional cooperation.

The ECSC was made up of only six countries (France, Germany, Belgium, the Netherlands, Luxembourg, and Italy) brought together with the aim of having a common body controlling the coal and steel industries, so as to avoid the uncontrolled re-armament of any country, notably Germany. Therefore, the ECSC did not merely replace the OEEC, which in fact had comprised 18 countries, but initiated a new form of functional regional cooperation⁵.

The period from 1952 to 1957 was characterized by deep and divisive political disagreement over loss of sovereignty and failed to develop any genuine economic cooperation. In 1957, the Treaties of Rome created the European Economic Community (EEC) with the overarching aim of creating a common market, going beyond a simple free trade system and aiming at the creation of a single market based on four fundamental freedoms: freedom of movement of goods, persons, services, and capital.

Seven states antagonistic to relinquishing any national sovereignty created the European Free Trade Agreement in 1960. These countries were the United Kingdom, Denmark, Norway, Sweden, Austria, Switzerland, and Portugal. They were later joined by Finland and Iceland. With the increasing success of the European Community, however, most countries left EFTA and joined the European Economic Community. Today, only Switzerland, Iceland, Lichtenstein and Norway remain in EFTA. Moreover, these EFTA countries have adopted large parts of the European Union rules and are part of the European Economic Area EEA, which ensures free trade, free movement of labor, and, to some extent, the free movement of capital.

One of the first priorities of the European Community was structural development of agriculture through increased farm productivity. Rural poverty, the need to manage population movement to urban and industrial areas and the need to increase agricultural production fast led to the creation of the first common policy, the Common Agricultural Policy (CAP) in 1962. This policy guaranteed prices for farmers and created a stable common market in those products. The policy was very successful in increasing production but led to market distortions and other negative effects, some of which are still being corrected today.

³ See Moussis 2007, pp. 21–23.

⁴ A detailed analysis of the origins of the Coal and Steel Community is provided by Gillingham (1991).

⁵ Austria, Belgium, Denmark, France, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey, United Kingdom, and Western Germany (originally represented by both the combined American and British occupation zones (The Bizone) and the French occupation zone). The Anglo-American zone of the Free Territory of Trieste was also a participant in the OEEC until it returned to Italian sovereignty.

2.2 Emergence and principles of EU regional policy

By 1961 some elements of a regional development policy had emerged, but these were confined to programs to help the unemployed people. The ECSC offered concessional loans to regions affected by the restructuring of the mining sector and the European Investment Bank (EIB) (founded in 1958) granted loans for specific regional projects. However, the funds involved were limited and not based on any well defined strategy or eligibility criteria.

The first enlargement of the European Community in 1973 to include the UK, Ireland and Denmark accentuated regional disparities, disparities which were further heightened by the oil crisis of 1973. In 1975 the European Regional Development Fund was established with the aim of investing in infrastructure but its effectiveness was highly questionable (Martin, 1988). Funds were allocated nationally based on a quota, recipient member states deciding their use in projects co-financed by national budgets. It was in practice not regional and just transferred funds from wealthier to poorer member states with few conditions.

It was only in 1988 that a fully-fledged regional policy emerged, creating the foundation of the present system. An important driver for this development was the entry of Spain and Portugal, which—together with Greece, Southern Italy, and Ireland—created a wide area with per capita incomes considerably below those of the richer member states. Under the leadership of the European Commission's President, Jacques Delors, important reforms of the Common EC budget took place, which boosted the role of the EU in regional development. This package of reforms, called the Delors I package, created an automatic system of budget resources and introduced multi-annual financial frameworks, which in turn allowed longer term regional development strategies. A large part of the support was directed towards infrastructure development. The package also markedly increased budget allocations for regional development and introduced guiding principles that are still in force today, in particular the shared management of funds between the Commission and national authorities. The development of these instruments was an attempted policy formulation of a number of theoretical writings on the impacts of economic integration on weaker regions (see Núñez-Ferrer, 2008).

Contrary to the previous system of transferring funds to countries (which in practice provided budgetary support to member states), the new system was project-based. EU funds are co-financing specific projects, thus member states do not have the freedom to use the funds arbitrarily. Accounting rules allow member states to include the funds de facto flowing through national budgetary systems in their balance sheets, but at the end of financial timescales all monies have to be used or returned and are then deducted from member states' contributions to the EU.

The disbursement of funds was based on five principles which still apply today: concentration, programming, partnership, additionality⁶, and monitoring and evaluation of programs and projects. Concentration means that interventions have to focus on areas in need, i.e., low-income regions where GDP per capita is less than 75% of the EU average or areas in industrial decline. Programming—as opposed to single project financing—calls for coordinated medium-term plans with overall objectives. Partnership imposes a shared responsibility for the preparation and implementation of programs between national and regional authorities and the European Commission.⁷ A rather radical innovation for many countries—which was bound to affect the governance structures of regions—has been the application of the

⁶ Additionality means that the funds add to possible funding from national sources and is not a substitute for these.

⁷ For an authoritative review of the EU's regional policy see Armstrong and Taylor (2000).

principle of “subsidiarity”, i.e., the role of regions in determining their own development programs.⁸

One of the most important decisions affecting regional development funds was the creation of specific regional policy objectives and the establishment of clear eligibility criteria. Originally, any region which was nationally eligible for regional funds could be a beneficiary. This caused an allocation of funds based on inconsistent eligibility criteria, as member states could change the level of support received by altering national eligibility parameters.

The new objectives of regional development included:

- 1) Development and structural adjustment of poorer regions (as indicated above based on the GDP per capita criteria of below 75% of EU average);
- 2) Conversion of regions or parts of regions seriously affected by industrial decline;
- 3) Combating long-term unemployment;
- 4) Job and career integration of young people;
- 5a) Accelerated reform of agricultural structures;
- 5b) Development of rural areas.

While objectives 1, 2, and 5b were territorially determined, funds earmarked for objectives 3, 4 and 5a could support programs not limited to particular areas.

The Community institutions did not have any powers in the field of trans-European networks in transport, energy, or telecommunications. However, the European Commission created a Transport Infrastructure Committee and a consultation procedure with the member states in 1978. The role of the European institutions, including the EIB, in approving funding for regional infrastructure conferred a capacity to influence their development, without by-passing the strong institutional co-operation of the Commission with member states.

In energy and telecommunications the influence of the European Commission was smaller. The proper functioning of the internal market is in the remit of the European Commission and it increased its power and influence through its competition policy and its powers in facilitating cross-border mergers and acquisitions, as well as eliminating indirect trade barriers.

2.3 The creation of specific Trans-European Networks

The emergence of a policy towards intraregional and transnational infrastructure started properly with the Delors II package, which allocated new albeit modest spending for the 1994–1999 budget period. This package was a response to the Maastricht Treaty signed in 1992, which established the EU and clearly established the single market. The package addressed fears of increasing regional divergence created by the single market and the potential negative impact of the foreseeable introduction of a single currency. It doubled the assistance given to regional development and also created cohesion funds for trans-national transport corridors and other infrastructure in countries with a GDP per capita below 90% of the EU average, i.e. the cohesion group of countries (Spain, Portugal, Ireland, and Greece).

⁸ Armstrong and Wells (2006, pp. 855–876) argue that the evaluation of Structural Funds program has “systematically underplayed the effect of governance on both program design and implementation”. In order to evaluate these programs properly, formal partnership and management arrangements as well as wider governance structures and the importance of informal policy networks need to be taken into account.

This transnational infrastructure also included their connection to the Trans-European Networks.

The Maastricht Treaty provided the legal basis for the Trans-European Networks (TENs). It was felt that the integration of the internal market was hampered by the lack of well-integrated transport, energy, and telecommunications infrastructure between member states. The single market had as an aim to reduce the costs of having different national markets characterized by oligopolistic structures, with “a considerable non competitive segmentation of the market” (Emerson et al. 1988). The hugely influential Cecchini report (1988) calculated the costs for Europe of no integration, which was considerable in terms of GDP growth. The EU recognized that a large number of direct and indirect barriers to trade, labor and capital mobility were jeopardizing the benefits of integration and that this included a deficit in appropriate cross-border infrastructure.

More specifically, transport costs could act as a major barrier to trade. At the time, the road sector accounted for 80% of freight transport. Significant parts of road transport were subject to national authorizations and licenses and the terms and rules varied across the member states. The burden of taxation and the level of charges for road users differed significantly across member states, in effect creating non-tariff barriers to trade and undermining the single market.⁹ Combined rail-road transport was practically non-existent. It was recognized that coordination of investment decisions could “open the way to the economies of scale offered by the wider internal market”.¹⁰

Under the terms of the 1992 Maastricht Treaty¹¹, the EU must aim to promote the development of Trans-European Networks as a key element the creation of the Internal Market and the reinforcement of economic and social cohesion, including the interconnection and interoperability of national networks as well as access to such networks. Trans-European Networks are in fact recognized as an important factor for growth and their planning and financing are, according to the subsidiarity principles, better dealt with at a supranational level (Núñez-Ferrer, 2007a and 2007b).

Three classes of network were defined by the treaty:

⁹ For a further analysis, see Pelkmans 2006, pp 145–149.

¹⁰ Moussis 2007, pp. 112–113; pp. 414–415.

¹¹ Treaty of Maastricht, Treaty Terms Chapter XV of the Treaty (Articles 154, 155 and 156). Article 155 states:

1. In order to achieve the objectives referred to in Article 154, the Community:
 - shall establish a series of guidelines covering the objectives, priorities and broad lines of measures envisaged in the sphere of trans-European networks; these guidelines shall identify projects of common interest,
 - shall implement any measures that may prove necessary to ensure the interoperability of the networks, in particular in the field of technical standardization,
 - may support projects of common interest supported by member states, which are identified in the framework of the guidelines referred to in the first indent, particularly through feasibility studies, loan guarantees or interest-rate subsidies; the Community may also contribute, through the Cohesion Fund set up pursuant to Article 161, to the financing of specific projects in member states in the area of transport infrastructure.

The Community's activities shall take into account the potential economic viability of the projects.

2. Member states shall, in liaison with the Commission, coordinate among themselves the policies pursued at national level which may have a significant impact on the achievement of the objectives referred to in Article 154. The Commission may, in close cooperation with the member state, take any useful initiative to promote such coordination.
3. The Community may decide to cooperate with third countries to promote projects of mutual interest and to ensure the interoperability of networks.

- Trans-European Transport Networks (TEN-T);
- Trans-European Energy Networks (TEN-E or TEN-Energy);
- Trans-European Telecommunications Networks (eTEN).

Article 155 defines the responsibilities of Community:

- establish guidelines identifying projects of common interest;
- implement measures necessary for interoperability of networks;
- support projects of common interest e.g. through feasibility studies, loan guarantees or interest-rate subsidies;
- contribute to financing through the Cohesion Fund;
- promoting coordination between member states.

Article 156 clearly states that the Community does not have the final word in the appraisal of the TEN:

“Guidelines and projects of common interest which relate to the territory of a Member State shall require the approval of the Member State concerned.”

In 1996, based on a proposal by the European Commission, the EU agreed on guidelines for the development of the TENs¹². Initially the main thrust of the strategy was on transport, primarily because for member states the possible economic benefits of increased trade and mobility are clear, while energy and telecommunications are often controlled by public companies or powerful national champions. The opening of the telecommunications sector to competition and the increase in interoperability is slowly being achieved. For energy, the creation of trans-European networks also required the opening of national markets to competition. The basic requirement of privatizing and unbundling the energy sector was only completed with difficulty in 2008, and many member states hold significant shares of ownership in the energy sector, considered of national importance to ensure energy security.

As the telecommunications industry does not suffer from lack of infrastructure and connectivity, telecommunications ceased to be part of the TENs in 2006. All European countries adopted the GSM standard, which created immediate interconnectivity. The policy aims have rather been on ensuring liberalization of the sector, the breaking up of national monopolies, ensuring the elimination of interconnectivity barriers, reaching remote areas and improving e-services. The lack of hard infrastructure barriers was reflected in the rather modest budget of €175 million for the period (2003–2006). Most of the aims are pursued by a new program, i2020, which is not part of the TENs.

3. TEN-T, FROM A SLUGGISH START TO A CENTRAL POLICY

3.1 Decision-making and management of Trans-European Networks

The role of the EU institutions in the development of the TENs has been one of facilitator rather than developer or manager. The European Commission is not

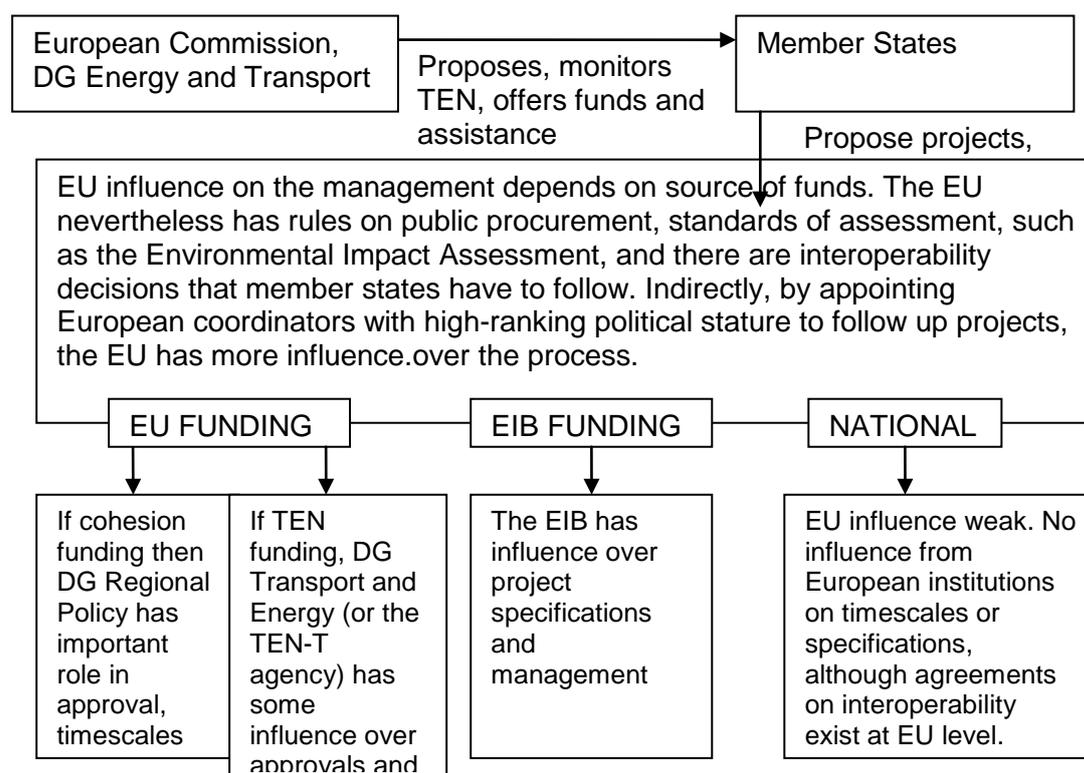
¹² Decision No. 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community guidelines for the development of the trans-European transport network.

mandated to manage the TEN projects, but it is responsible for defending the interests of the EU and ensuring that the Treaties are implemented. The EU proposed the creation of trans-European infrastructure to member states and convinced them of the importance of the 1992 Treaty of Maastricht..

The creation of the TENs presented four major challenges: (i) achieving agreement on priorities, (ii) enforcement of commitments, (iii) streamlining management structures across member states; and (iv) finding formulae for cost burden sharing.

3.1.1 Achieving agreement on infrastructure priorities

The European Commission cannot compel the building of infrastructure on the territory of member states. The Commission may suggest and only has some power over member states if EU funding is involved. Thus the first task is making member states agree on a set of priority Trans-European projects. Figure 1 presents the role of the European Commission in guiding the TEN developments.

Figure 1: Role of EU Institutions in Decision-making and Management

Source: Authors' compilation.

3.1.2 Enforcement of infrastructure commitments

The European Commission cannot compel member states to build infrastructure. It can only exert influence on projects in receipt of significant EU funding. This means that it is easier for the EU to ensure that the TENs are developed in poorer member states which rely on EU cohesion funding rather than wealthier member states which do not need comprehensive EU-funded development strategies. As already mentioned, the appointment of European coordinators introduces implicit pressure to foster the development of the TENs.

3.1.3 Streamlining of management structures and obligations

Member states have their own assessment techniques and administrative procedures, making the development of infrastructure projects at border areas particularly cumbersome. The European institutions are, however, proactive in supporting the establishment of joint-management mechanisms. EU legislation also includes the possibility for any company to establish a so-called "European Company". This "European Company" statute was created to facilitate the single market and the legal base is a 2001 regulation¹³, which entered into force in 2004. This is an important piece of legislation which was first proposed thirty years before its final adoption. Even today, there are some complications remaining as employment and tax obligations differ across countries. Some clarification has been provided by a subsequent Directive¹⁴.

¹³ Council Regulation (EC) No. 2157/2001 of 8 October 2001 on the Statute for a European company (SE)

¹⁴ Council Directive 2001/86/EC of 8 October 2001 supplementing the Statute for a European company with regard to the involvement of employees

The European Company statute is for larger pan-European operations. It requires a minimum capital of €120,000 and is applicable to four cases of company formation:

- a) Merger: available only to public limited companies from different member states;
- b) Formation of a *Societas Europaea* holding company: is available to public and private limited companies with their registered offices in different member states or having subsidiaries or branches in member states other than that of their registered office;
- c) Formation of a joint subsidiary is available under the same circumstances to any legal entities governed by public or private law;
- d) Conversion of a public limited company previously formed under national law.

In any case, the possibility of creating a European Company has greatly facilitated cross-border co-operation. The legislation is quite precise on the management structures and obligations, eliminating many possible ambiguities.

3.1.4 Cost burden sharing

Cross-border infrastructure projects can have asymmetric impacts on the countries concerned with the share of costs on the national territory not proportional to the benefits. Similarly, the extent of other negative factors, such as the creation of pollution in transit countries, may considerably reduce the benefits.

The main role of the EU is as facilitator. It also proposes legislation to guarantee “intermodality”, which is an important aspect for such infrastructure. The EU has agreed on rail and road rules to facilitate the creation of multinational transport infrastructure. After the 2003 decision to accelerate the development of the TENs, several actions have been taken, such as the creation of a European Railway Agency to implement various EU Directives for rail network interoperability, which includes common rules on design, construction, commissioning, upgrading, renewal, operation, and maintenance of the parts of this system placed in service after the entry into force of the directive, as well as the qualifications and health and safety conditions of the staff who contribute to its operation. Similarly, the EU has adopted a number of other directives on road and air transport.

Due to the difficulties in coordinating the response of member states in the area of transport, the EU created a Transport Executive Agency in 2006 to assist in the development of the TENs. In 2008 the Transport Executive Agency took over responsibility for the entire management of the TEN-T projects, which had previously been under the control of the European Commission. The projects will still be the responsibility of member states, but the executive agency will monitor and assist for their implementation. The European Coordinators will also facilitate the realization of complex areas of projects, by bringing political weight to the process. The tasks allocated to the agency are:

- ensuring the technical and financial management of projects and events co-financed under the trans-European transport networks' budget;
- collecting, analyzing and transmitting to the Commission all information required for the implementation of the trans-European transport network, as well as assisting the Commission with TEN-T network programming;
- providing technical support to project promoters and the financial institutions responsible for managing the loan guarantee instruments for the TEN-T projects;
- providing any technical and administrative support requested by the Commission;
- Policy and institutional issues will be handled by the European Commission.

The agency supports member states in the development of the TENs, assists in setting up Public-Private Partnerships (PPPs) and making EU grants or obtaining EIB support. Priority projects are followed by the European coordinators. Annual reports on progress are presented by them.¹⁵ Political aspects of the TENs remain in the hands of the European Commission's Directorate General for Energy and Transport.

For Energy, the European Commission has also set up European coordinators, but no separate agency, and the projects are still followed from within the Commission.

In all cases, member states are responsible for implementing the projects planned and are eligible for support from EU funds under various aid systems. Hence there is no unified management system.

3.2 The European Coordinators

Given the rather weak progress in the development of the Trans-European Networks, the European Commission adopted in July 2005 a decision (No C (2005) 2754 of 20 July 2005) establishing a procedure to appoint European Coordinators in charge of specific priority projects, for individual cross-border sections, for groups of projects located in the same priority axis, or for a whole axis. These appointments are for four years. The European Commissioner in charge of Energy and Transport thus appoints high-level political figures to mediate between countries and push forward the TEN agenda. The Commission correctly assessed that coordinators would introduce the necessary political impetus to deal with difficult cross-border operations, that require international collaboration. In addition, these coordinators would promote the projects to private investors and financial institutions. The Coordinators regularly report to the European Commission. The first and second reports were published in July and September 2007 and are available online from the site of the Trans European Transport Networks¹⁶.

Coordinators are not remunerated for this service: only costs incurred for the performance of their duties are reimbursed. For the TEN-T projects, the following political figures were appointed:

¹⁵ http://ec.europa.eu/ten/transport/coordinators/index_en.htm (accessed 30 July, 2008)

¹⁶ http://ec.europa.eu/ten/transport/coordinators/index_en.htm

	Relevant positions	Assigned to:
Karel Van Miert	Belgian politician; Former European Commissioner from 1989 to 1999. Chairman of the Van Miert group assessing the TEN-T progress in 2003.	Priority Project 1: Berlin-Verona/Milan-Bologna-Naples-Messina-Palermo rail link
Etienne Davignon	Belgian politician, Former vice president of the European Commission 1977–1985	Priority Project 3: South-west European high-speed rail link
Laurens Jan Brinkhorst	Dutch politician; Twice minister, for agriculture and economic affairs, EU ambassador to Japan 1983–1987, Member of the European Parliament 1994-1999	Priority Project 6: Lyon-Trieste-Divača/Koper-Divača-Ljubljana-Budapest-Ukrainian frontier rail link
Péter Balázs	Hungarian diplomat; Former European Commissioner for Regional Policy, Former state secretary, ambassador to the EU	Priority Project 17: Paris-Strasbourg-Stuttgart-Vienna-Bratislava rail link
Pavel Telicka	Czech Diplomat; Former chief negotiator for accession negotiations, former European Commissioner	Priority Project 27: “Rail Baltica” Warsaw-Kaunas-Riga-Tallinn-Helsinki rail link
Karel Vinck	Belgian businessman; Chairman and member of several boards of directors in the energy and transport sectors. Former president and chief executive officer of Belgian Railways.	ERTMS project, the European Rail Traffic Management System

Similarly, for the energy projects, the Commissioner for Energy, Andris Pielbags, appointed in 2007 four project coordinators for the TEN-E projects. The coordinators have the mandate to facilitate the development of a high-voltage connection between France and Spain (transnational part of project EL3); offshore wind energy connections in the Baltic and North Sea areas (transnational part of project No.EL7); the NABUCCO natural gas pipeline (NG3), and a power connection between Germany, Poland and Lithuania (EL8).

The political figures appointed as coordinators are:

	Relevant positions	Assigned to:
Mario Monti	Italian academic and politician, Former Commissioner for the Internal Market and later Competition, presently President of Bocconi University in Milan, Italy	Transnational part of project EL3. Electricity connection between France and Spain. This line is central to link the isolated Iberian energy sector to the core energy sources of the European Union.
Georg Wilhelm Adamowitsch	German politician, State secretary, Federal Ministry of Economics and Technology	Transnational part of project No.EL7 Offshore wind connections in the Baltic and North Sea areas (Denmark, Norway, Germany and Poland). This project aims to integrate of the offshore wind energy produced in the Baltic Sea and North Sea with the continental grid.
Jozias Johannes van Aartsen	Dutch politician, Former Minister of Foreign Affairs	NABUCCO natural gas connection (NG3) Project linking Turkey and Austria through Romania, Bulgaria and Hungary. This link should connect the gas resources of Central Asia, the Caspian region and the Middle East with central Europe.
Wladyslaw Mielczarski	Life Professor in Electric Power Engineering	(EL8) Power connections between Germany, Poland and Lithuania. Reinforcing the Nordic Power exchange (Nord Pool) and linking the Baltic grid to the continental network (Germany and Poland).

The declarations of the Treaty of Maastricht were followed by a European Council declaration in 1994 which presented 14 priority transport projects, named as the “Essen Projects” based on the city where the declaration was agreed. These 14 projects were based on the recommendations of the Christophersen group, formed of representatives of heads of state or governments, which identified the priority projects for transport and energy. The 14 were drawn from a list of 34 projects.

The project selection was based on the following criteria which stipulated that projects had to:

- (i) be in accordance with Community guidelines for the development of a trans-European transport network;

- (ii) be of exceptional size, bearing in mind the type of project and the relative size of the member states directly concerned;
- (iii) pass the economic viability test, including improvements of competitiveness and the technological performance of the Union;
- (iv) allow for the possibility of private financing;
- (v) be mature enough in order to be carried out quickly;
- (vi) avoid the use of public finance for infrastructure which would lead to distortions of competition contrary to the common interest;
- (vii) respect Community legislation, in particular concerning environmental protection.

In 1995 a budget line for the TEN was created to supplement the cohesion funds and regional funds allocated to poorer member states and regions. The funds allocated to the Trans-European Networks for transport energy and telecommunications was very limited, a total of €2,345 million for the period 1995–99. This, however, was for aid to wealthy member states. Poorer member states were able to use higher support from funding from the cohesion policy. The total allocation depended on national strategy.

In 1996 European Council Decision 1692/96 set clearer reference criteria for each mode of transport. The decision included a larger list of priority projects to be completed by 2010. The end of Soviet influence in eastern Europe and the prospects of enlargement of the EU to the east created the need for an expansion of the TENs. The Transport Infrastructure Needs Assessment (TINA) was released with an additional ten priority land and sea corridors.

For eastern European Countries the EU offered different financial support for the TENs: €1.8 billion from the Programme of Community aid to the countries of Central and Eastern Europe (PHARE) program; €1bn from the Instrument for Structural Policies for Pre-Accession (ISPA) program; €4.8bn through the EIB, and technical support through the Technical Assistance to the Commonwealth of Independent States (TACIS) program. This was combined and coordinated with EBRD and World Bank loans.

Despite declarations to the contrary, member states did not whole-heartedly embrace the idea of investing in trans-European networks, except for very specific transport projects, in particular high-speed trains. An underlying commitment to the strategy in the interest of the EU was missing. By 2001 only three priority projects had been completed (see Table 3 in the section “Financial Aspects”).

The European Commission accordingly released in 2001 a white paper analyzing the reasons for the sluggish development of transport infrastructure and suggested some solutions. That same year EU heads of state agreed on the need to focus more on the environmental needs of policies and to concentrate on railways, inland waterways, sea shipping, intermodal operations and effective interconnections between modes of transport.

Member states, however, were unable to agree on a revision of the 1996 decision, as promoted by the white paper. Given the impasse, in 2003 a High-Level Group (HLG) was set up to carry out a comprehensive review of TEN-T progress. This group was chaired by the European transport commissioner and composed of representatives of member states and candidate countries for EU membership. The EIB also participated in the meetings.

The HLG presented a report which criticized the TEN-T projects as lacking coherence. It criticized the fact that planned projects (the Essen projects and those added later) had been selected on the basis of their importance for member states rather than in the interest of creating a coherent EU network. It also said that there

appeared to be project packages composed of a number of disparate projects. The HLG thus developed a methodology for choosing the projects avoiding the pitfalls of the first plans. They introduced the concept of major “trans-European axes” linking all projects into a more coherent web. The report introduces the concept of Community Added Value to the selection criteria. Nevertheless, the report does integrate all 14 initial Essen projects into the new list. This seems to contradict the statement on lack of coherence and there is probably an underlying political reason for adding the 14 Essen projects to the new list. There is no clear interpretation in the literature reviewed.

The group evaluated projects in a two-stage process. Projects were first screened on a number of basic criteria. Those which did not meet them were eliminated. The criteria are the following:

- *Being on a main trans-European axis pertinent to the internal market of the enlarged Europe, taking in particular into account projects crossing natural barriers, solving congestion problems or corresponding to missing links;*
- *Having a European dimension in particular by meeting a threshold of €500 million for infrastructure;*
- *The existence of evidence showing potential economic viability, other socioeconomic benefits (e.g., social, environmental), and firm commitments from the concerned Member states to carry out the required impact assessments with a view to completing the project within an agreed timeframe.*

(HLG, 2003, p.25)

The remaining projects then were evaluated according to a second group of criteria:

- *The European added value of the project, in terms of importance for facilitating exchanges between member states, for instance improving interconnections and interoperability between national networks;*
- *The strengthening of cohesion, either by better incorporating the future member states into an enlarged Europe, or by connecting the main peripheral areas and the least developed regions to the rest of Europe;*
- *The contribution to the sustainable development of transport while tackling the problems of safety and of environmental protection and by promoting modal transfer.*

(HLG, 2003, p.25)

Based on this process, in addition to the Essen group of projects, the HLG selected 22 from more than 100 projects nominated by member states. All delegations, except those from Greece, Belgium, and Luxembourg accepted the new list.

The projects were divided into the following categories:

List 0: Essen projects completed or expected to be completed before 2010;

List 1: Essen projects with a firm commitment to completion before 2010;

List 2: Longer-term Essen projects;

List 3: Other important projects, but not priority projects, which are important for territorial cohesion.

The projects chosen fulfilled a requirement to increase intermodality and shift transport to rail and away from roads, reflecting the need to reduce the negative environmental effects of transport. The heavy road bias of the first projects was thus counterbalanced.

However, road and rail are not the only concerns of the TEN-T plans. Motorways of the sea, coordination with air transport and the Galileo project for an EU satellite navigation system, all are part of the plan.

The HLG report requested that the following requirements be taken into account in the development of the TEN-T network:

- Motorways of the sea should complement mainland axes;
- National rail networks should be more interoperable, specifically with respect to signaling and telecoms;
- Part of the rail network should be dedicated to freight;
- Air traffic management should be integrated;
- A river information system should be established;
- A vessel traffic management and information centre should be created;
- Existing airports should be better managed;
- Main European axes should be identified;
- Acceding countries should be integrated;
- Community aid should be increased.

(European Commission, 2005)

The report also suggested a new financing approach, as the costs of the TEN-T projects cannot be shouldered by normal public procurement alone. The cost of the whole network has been estimated at over €500 billion. The report calls for innovative systems of PPP financing and the use of modern toll systems for motorways to recover investment and maintenance costs.

In addition the report calls for a standardized approach to the development of infrastructure, with better coordination, common impact assessments and the creation of transnational legal entities.

In 2003 the European Commission published new guidelines and financial rules and performed an extended impact assessment to assess the impact of the new plans compared with taking no action, the completion of the 2001 proposed white paper plans, and the completion of the new structures based on the HLG results.

The results showed an important improvement in the EU's transport, environment and growth performance (Table 1). The table shows the possible impact of two different scenarios of the TEN-T development compared to no development. The European scenario shows the results of implementing all priority projects agreed before 2001 and half of those in accession countries. The European+ scenario assumes the development of further infrastructure, which were agreed in 2003 and the completion of eastern European transport infrastructure projects.

Table 1: The Results of the European Commission's Extended Impact Assessment

Category	European	European+
Economic		
Potential travel time savings	€4.4 billion	€7.7 billion
Cost	€113 billion	€196 billion
Effects on internal market dynamics	Small increase of international traffic	Increase of international traffic particularly important for acceding countries
Reduction in road congestion delays	3%	14%
Sustainable Development		
Modal rebalancing	Reduction of road growth on international market segments	Stabilisation of modal split at European level, reduction of road growth on international market segments and in 12cc
Emission reduction	€0.4 billion	€0.7 billion
Impact on nature	Risks to be further assessed at local level in particular for inland waterway projects	Risks to be further assessed at local level in particular for inland waterway projects
Social		
Accidents	Fewer accidents due to modal shift and better quality infrastructure	Fewer accidents due to modal shift and better quality infrastructure
Balanced territorial development	Relative accessibility to improve for peripheral countries	Relative accessibility to improve most for peripheral and acceding countries
Higher GDP growth and employment	n.a.	Welfare 0.23 % GDP or one million permanent jobs

Source: European Commission (2003a). p. 50

The revised guidelines and financial rules were adopted in 2004 by European Council Decision 884/2004 and Regulation 807/2004. The guidelines are now as follows:

(a) the establishment and development of the key links and interconnections needed to eliminate bottlenecks, fill in missing sections and complete the main routes, especially their cross-border sections, crossings of natural barriers, and improve interoperability on major routes;

(b) the establishment and development of infrastructure which promotes the interconnection of national networks in order to facilitate the linkage of islands, or areas similar to islands, and landlocked, peripheral and outermost regions on the one hand and the central regions of the Community on the other, in particular to reduce the high transport costs of these areas;

(c) the necessary measures for the gradual achievement of an interoperable rail network, including, where feasible, routes adapted for freight transport;

(d) the necessary measures to promote long-distance, short sea and inland shipping;

(e) the necessary measures to integrate rail and air transport, especially through rail access to airports, whenever appropriate, and the infrastructure and installations needed;

(f) optimization of the capacity and efficiency of existing and new infrastructure, promotion of intermodality and improvement of the safety and reliability of the network by establishing and improving inter-modal terminals and their access infrastructure and/or by deploying intelligent systems;

(g) the integration of safety and environmental concerns in the design and implementation of the trans- European transport network;

(h) development of sustainable mobility of persons and goods in accordance with the objectives of the European Union on sustainable development.

Source: Article 19 in Decision 884/2004

As requested by the HLG, priority projects need to be selected on clear criteria. The new decision presented the following list of criteria to be used:

(a) are intended to eliminate a bottleneck or complete a missing link on a major route of the trans- European network, in particular projects which are cross-border projects, cross natural barriers or have a cross-border section;

(b) are on such a scale that long-term planning at European level will help significantly;

(c) present, overall, potential socio-economic net benefits and other socioeconomic advantages;

(d) significantly improve the mobility of goods and persons between member states and thus also contribute to the interoperability of national networks;

(e) contribute to the territorial cohesion of the European Union by integrating the networks of the new member states and improving connections with peripheral and island regions;

(f) contribute to the sustainable development of transport by improving safety and reducing environmental damage caused by transport, in particular by promoting a modal shift towards railways, inter-modal transport, inland waterways and maritime transport;

(g) demonstrate commitment on the part of the member states concerned to carrying out studies and evaluation procedures in time to complete the work in accordance with a date agreed in advance, based upon national plans or any other equivalent document relating to the project in question.

Source: Article 19 in Decision 884/2004

The guidelines also revised the TEN-T network and presented a list of 30 priority projects.

Trans-European transport network (TEN-T)

Priority axes and projects

1. Railway axis Berlin–Verona/Milan–Bologna–Naples–Messina–Palermo
2. High-speed railway axis Paris–Brussels–Cologne–Amsterdam–London
3. High-speed railway axis of south-west Europe
4. High-speed railway axis east
5. Betuwe line
6. Railway axis Lyons–Trieste–Divaca/
Koper–Divaca–Ljubljana–Budapest–Ukrainian border
7. Motorway axis Igoumenitsa/Patras–Athens–Sofia–Budapest
8. Multimodal axis Portugal/Spain–rest of Europe
9. Railway axis Cork–Dublin–Belfast–Stranraer
10. Malpensa airport
11. Øresund fixed link
12. Nordic triangle railway/road axis
13. United Kingdom/Ireland/Benelux road axis
14. West coast main line
15. Galileo
16. Freight railway axis Sines/Algeciras–Madrid–Paris
17. Railway axis Paris–Strasbourg–Stuttgart–Vienna–Bratislava
18. Rhine/Meuse–Main–Danube inland waterway axis
19. High-speed rail interoperability on the Iberian peninsula
20. Fehmarn belt railway axis
21. Motorways of the sea
22. Railway axis Athens–Sofia–Budapest–Vienna–Prague–Nuremberg/Dresden
23. Railway axis Gdansk–Warsaw–Brno/Bratislava–Vienna
24. Railway axis Lyons/Genoa–Basle–Duisburg–Rotterdam/Antwerp
25. Motorway axis Gdansk–Brno/Bratislava–Vienna
26. Railway/road axis Ireland/United Kingdom/ continental Europe
27. ‘Rail Baltica’ axis Warsaw–Kaunas–Riga–Tallinn–Helsinki
28. ‘Eurocaprail’ on the Brussels–Luxembourg–Strasbourg railway axis
29. Railway axis of the Ionian/Adriatic intermodal corridor
30. Inland waterway Seine–Scheldt

The regulation calls for the designation of European Coordinators appointed by the European Commission to co-ordinate and develop complex sections of the priority projects or exceptionally an entire major axis.

In 2006 the EU established the Trans European Network Executive Agency to manage EU funds for the realization of the TEN-T projects. These coordinators act on behalf of the European Commission. Their tasks are defined in the decision as:

(a) to promote, in cooperation with the member states concerned, joint methods for the evaluation of projects and, where appropriate, advise project promoters on the financial package for projects;

(b) to draw up a report every year for the European Parliament, the Commission and the member states concerned on progress achieved in the implementation of the project(s) for which he/she is responsible, new regulatory or other developments which could affect the characteristics of the projects and any difficulties and obstacles which may result in a significant delay in relation to the dates indicated in Annex III;

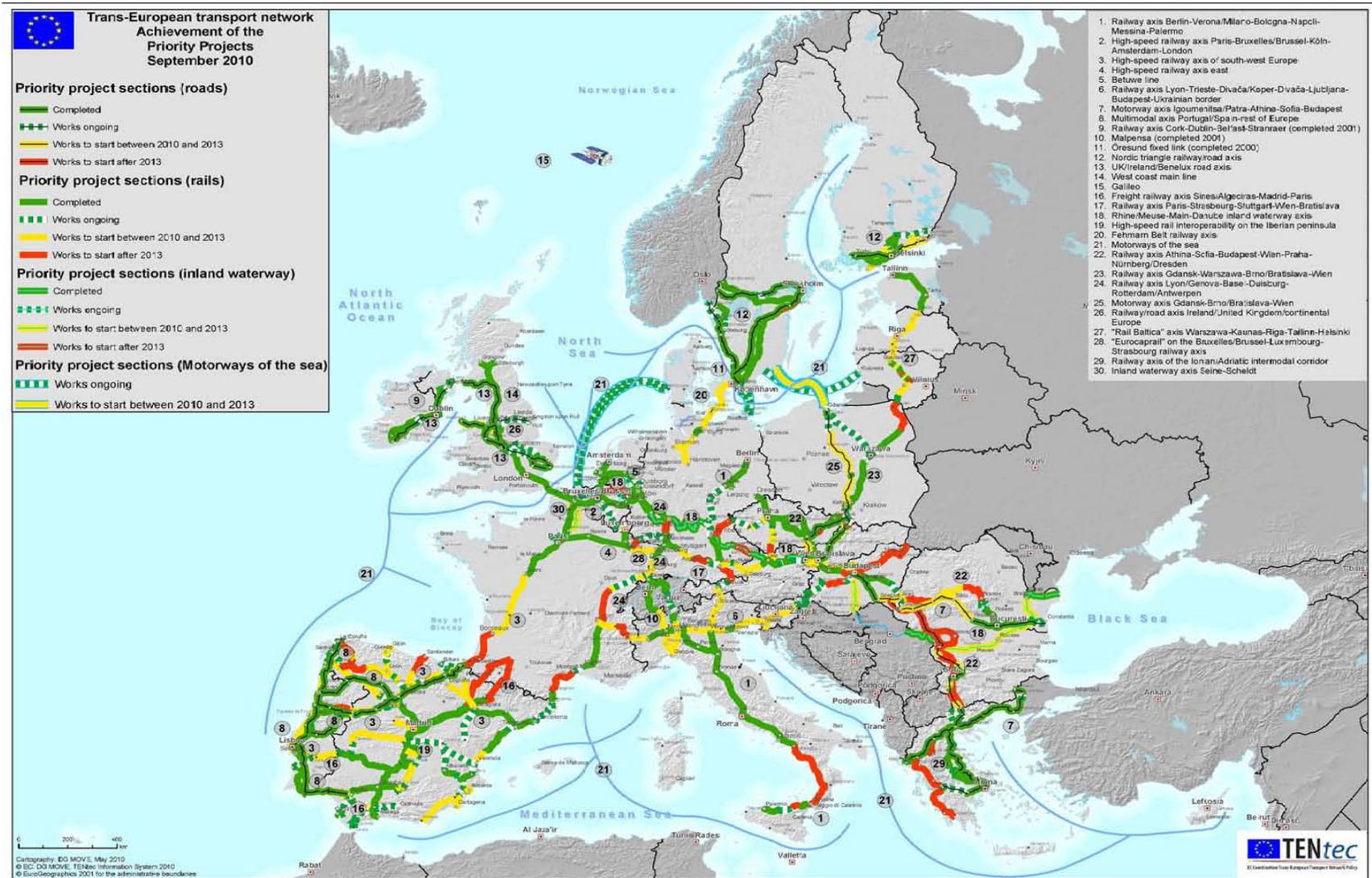
(c) to consult, together with the member states concerned, regional and local authorities, operators, transport users, and representatives of civil society with a view to gaining fuller knowledge of the demand for transport services, the possibilities of investment funding and the type of services that must be provided in order to facilitate access to such funding.

Source: Article 7 (5) in Decision 884/2004

Given the delays to projects, it was decided that the 2010 target for completion be put forward to 2020. Projects that are not developed under the agreed deadlines may lose the support of EU funds.

Work in recent years has been accelerating, and despite the Commission's concern that the 2020 deadline will not be reached, many projects are on track. A 2010 detailed analysis and progress report from the Commission's Directorate-General for Mobility and Transport on TEN-T notes considerable progress.

Figure 2: TEN-T Priority Projects—A Detailed Analysis



Source: European Commission 2010

3.3 Financial aspects of TEN-T infrastructure

The most significant barrier to the development of the TEN-T projects in addition to the political, legal, and administrative barriers has been financing. The financial demands are significant as the use of traditional public procurement is limited as is obtaining the necessary financial input from commercial banks. The latest total estimates in 2007 for the construction of the overall network has been of €900 billion, €250 billion for the priority projects alone, and €112 billion for the Essen projects still to be carried out.

To have an idea of the challenge ahead, expenditure over the first nine years 1996 to 2005 on the TEN-T projects was approximately €75 billion. To complete the project over the next 15 years investment effort needs to increase more than fivefold. At the present rate of investment, however, it needs only a doubling of financial effort, as the first five years were particularly uneventful and expenditure only really started to increase after 2001.

So far the main sources of funding have been national public funds. The EU offers some co-financing support through the TEN-T and structural and cohesion funds. Due to budget limitations, these have only contributed a very small share: total funds contributed from 2000 to 2006 were approximately €30 billion. Most of these funds are allocated to poorer member states and regions. The EIB's Structured Finance Facility also played a significant role. The national and private financing contributions (private being rather limited) were €208 billion.

Table 2: Community Financing of TEN-T (EUR billion)

	1993-1999	2000-2006	Share 1993-06	2007-2013(a)	Share 2007-13
TEN-T budget	2.2	4.43	1.7%	8	2.1%
Cohesion Fund (b)	8.3	17.33	6.6%	34.79	8.9%
ERDF (Structural Funds)	7.5	8.6	4.1%	8.33	2.1%
EIB(c)	26.5	44.9	18.3%	54	13.9%
Other sources (d)	63.4	208	69.4%	283.88	73.0%
Total	107.9	283.26		389 (e)	

Source: European Commission (2008)

Notes: (a) Indicative figures; (b) Including the Pre-Accession Structural Instrument (ISPA); (c) Between 1993–1999 loans for EU15. From 2000 loans in EU-27; (d) Public budgets and private financing; (e) Total investment needs from Implementation Report 2004–2005

Member states have had difficulties in raising the finance required from government budgets. It is interesting to note that the member states (EU15) spent 1.5% of EU GDP in transport infrastructure in 1980, and that this fell to less than 1% in 2010. New member states spent 1.5% of their GDP on transport infrastructure, but these countries also obtain support from the EU budget and even for this level of expenditure there have been issues about the absorption capacity of funds.

Progress on priority projects is described in Annex 1. While a number of projects are nearing completion, no more have been completed than the three which were closed before 2001.

European grant funding has its limitations. In poorer regions of the EU up to 85% of costs can be covered (2007–2013), for other areas the only funds available are those dedicated to TEN-T which finance 50% of cost of studies and priority projects (including the satellite positioning system Galileo), 30% for cross-border projects and 10% for non-priority projects. Particularly important is the clause which states that unreasonable delays will cause projects to lose EU financial support.

The EU's budget also provides for EIB loan guarantees, the LGTT (Loan Guarantee instrument for Trans-European Transport network projects). This is an instrument developed jointly between the European Commission and the European Investment Fund. Each year the EU transfers a given sum to the EIB in the form of loan guarantees. This is then used to cover part of the risk of projects, improving the viability of projects and their attractiveness for private investors. LGTT is financed with a capital contribution of €1 billion (€500 million each from the Commission under the TEN-T budget and the EIB) which is intended to support up to €20 billion of senior loans. The amount of guarantee never exceeds more than a €200 million, while the EIB is expected to offer €50 billion in loans over the next decade (EIB 2006a, EIB 2008).

The EIB itself offers loan guarantees through the European Investment Fund and has created a new financial instrument, the Transport Investment Facility (TIF). This consists of loans with maturities of up to 35 years and covering up to 75% of cost. The role of the EIB is explained in more detailed in a joint paper by Van der Geest and Núñez-Ferrer.¹⁷

The European Commission's proposed level of funding in the TEN-T network was not approved by the budget authorities and was considerably reduced for the period 2007–13 requiring the need to find alternative solutions.

PPPs have been increasingly and successfully used to finance the development of the TENs, reducing overall costs and increasing efficiency. However, the use of user fees has been very limited and ultimately the main bulk of the risks and costs have fallen on national governments. The attempt of the European Commission to introduce road charges with a "Eurovignette" has not been successful, although the Commission has not abandoned the idea and still presses in this direction. The mechanism is described in more detail in a document on innovative financing methods (European Commission, 2003b). Only some countries use this to cover road infrastructural costs. A detailed analysis of the use of PPPs is presented in a twin paper by Van der Geest and Núñez-Ferrer.

In addition to core infrastructure projects, support is given to the create European management systems for transport, support for road, air, maritime and coastal management systems or the important European Rail Traffic Management System (ERTMS), as rail has particular interoperability needs.

3.4 Project appraisal

The increased involvement of new funding schemes and the use of PPPs require a thorough review of project appraisal techniques. Member states have different traditions of project appraisal and many are not well-suited to private finance. Project evaluation has been of variable quality in the member states. The European Commission itself has had to develop and is still reinforcing evaluation techniques. Cost-benefit analyses and long-term investment returns from complex infrastructure projects are difficult to calculate and often under or over-estimate user demand and final costs.

The evaluation of public projects also needs to assess social benefits, not just financial costs. For the TENs the Europe-wide benefits are often used as a central reason for the existence of the TENs (see HLG, 2003). However, the benefits of a project may well be very different at national level. There are complex issues surrounding the national analysis of the TENs projects and the EU's position. There is a need to clarify whether for transport infrastructure is a responsibility of national or supranational bodies. Member states finance the bulk of projects and national appraisal of the value of a project is a key element in decision-making.

The EU's appraisal system combines a Cost Benefit Analysis (CBA) combined with a Multi-Criteria Assessment (MCA) in which a wider set of objectives are incorporated in the

¹⁷ Appropriate Financial Instruments for Public Private Partnership to boost Asia's cross-border Infrastructural Development, Van der Geest, W., and Núñez-Ferrer J. ADBI Discussion Paper.

valuation in addition to those directly involved in a pure CBA (European Commission, 2005). In the end, however, projects need to be commercially viable, in particular when private finance is involved. The EU and member states have developed different project appraisal systems. What is clear is that regardless of the wider goals and social benefits, projects which are deemed not commercially viable on the basis of a formal CBA will not be successful in attracting private funding, at least not without public support to mitigate risks.

Where the EIB is involved, the EIB's project appraisal process has had a very strong influence in the selection process of contractors and the kind of co-financing system, national or private. The EIB plays a strong role in the public procurement procedures and imposes strict rules to protect its investment (EIB, 2004, 2005, 2006b).

3.5 Mini case study of multinational infrastructure: Thalys International

A classic example of multinational cross-border regional infrastructure within the EU is the provider of rail-services Thalys International, a limited liability cooperative jointly-owned by the French, Belgian and German railways.¹⁸ The company's capital base is divided between the three companies with the French SNCF holding 62%, 28% held by the Belgian SNCB/NMBS and 10% held by the German DB.

Thalys International meets all of the Kawai criteria¹⁹ as it is a "regional infrastructure project" with:

- (i) physical infrastructure developed across four countries (Belgium, France, Germany, Netherlands);
- (ii) significant cross-border sales;
- (iii) a technically and financially indivisible project involving several independent national railways working together in a unified program;
- (iv) project implementation is carried out in four countries; the service is offered on behalf of the four companies mentioned above in the different locations.

It is worth emphasizing that the relative importance of the four operators varies a great deal. First and foremost, the French national railways SNCF play a dominating role: in addition to being the majority shareholder SNCF also has a good deal of technical know-how. The Thalys rolling stock is an advanced model of the French TGV, developed by Alstom.²⁰ Senior staff and the CEO of the company are French and the language culture in the company combines French and English, even though Thalys is incorporated in Belgium.

The two minority shareholders provide a smaller share of services, with the Belgian SNCB/NMBS providing the operational hub of the network in Brussels.

¹⁸ Operating since June 1996, it provides services between Paris, Brussels, Amsterdam and Cologne, using newly-constructed high-speed rail lines. The travel time between Brussels and Paris is 1hr 22 minutes for a 300 km journey. As of 2009, after much delay, the opening of a new dedicated high-speed rail link between Amsterdam and Brussels reduced travel time between those cities by just under an hour, from 2h37 to 1hr44.

¹⁹ Professor Kawai defined "transnational infrastructure" as multi-country, cross-border infrastructure managed by several separate national authorities or companies.

²⁰ Thalys uses two models of trains, both of which are part of the TGV (train à grande vitesse) family of high-speed trains built by Alstom in France. The first type, the PBA (Paris-Brussels-Amsterdam) is a tri-current electric multiple unit descended from the TGV Réseau. This type can operate only between the cities given in its name. The PBKA (Paris-Brussels-Koln-Amsterdam) is a type derived from the TGV Duplex double-deck sets, although the Thalys trains are only single deck. These units are quadri-current, and can operate to four destinations (Amsterdam, Brussels, Cologne and Paris). Source: Wikipedia, <http://en.wikipedia.org/wiki/Thalys> (accessed 30 July, 2008)

Even though the Dutch railway NS is not a shareholder, unlike the German DB, it is an important operator, as a significant part of Thalys's activities take place in the Netherlands and the Netherlands provides an important revenue base. The route through the Netherlands was designed to be part of the network from the outset, even though the provision of a dedicated high-speed railway line connecting Amsterdam to Brussels and Paris has been in the making for a very long-time. Delays were encountered in obtaining the necessary approval with regard to the environmental impact. The Amsterdam-Brussels route traverses through the so-called "Green Heart" of the Netherlands. After extensive public consultation, the railway track needed to be redesigned, including a long stretch of subterranean tunnel in order to mitigate environmental impact.

3.5.1 Impact of the Thalys service

Experience has shown convincingly that the growth in demand for Thalys railway services is much beyond that which could be predicted from structural determinants of demand for such services, in particular demographic and economic factors. This is especially true for traffic between France and Belgium, but also between the Netherlands and France.²¹ The share of air-traffic has decreased, although the absolute number of air passengers has continued to increase.

Furthermore, customer satisfaction is high and the company outperforms other operators in the EU in punctuality. The pricing strategy, with a wide variety of fares ranging from €55 to €256 for a return ticket between Paris and Brussels, offers customers a great deal of choice.

This mini-case study demonstrates the importance of two particular institutional factors, first the issue of technical compatibility and second the regulatory regime with regard to privatization and non-public ownership of infrastructure and rolling stock.

Interoperability of the trans-European high-speed rail system

Cross-border networks are critically dependent on interoperability; indeed a minimal degree of interoperability may need to be treated as another indicator of the regional character of a particular infrastructure. Even in the case of European high-speed railways, interoperability has not yet been achieved in full.²²

To achieve a minimal degree of interoperability, EU member states adopted a directive on the interoperability of the trans-European high-speed rail system.²³ This directive seeks to promote interoperability of the various railway networks which exist across the European Union. It promotes a harmonization of standards of the high-speed rail systems across the different member states. The approach taken for the directive is to focus on "essential requirements" such as safety, reliability, environmental protection and technical compatibility. The approach to harmonization does not prescribe specific technologies or methods—it is understood that different suppliers and different operators may achieve these essential requirements through different methods.

However, member states are obliged to meet the "Technical Specification for Interoperability (TSIs)". These technical specifications are drawn up and revised by the European Railway Agency. The TSIs complement existing standards, formulated by EU standardization organizations. As the TSIs are binding on the member states, there are usually phase-in

²¹ Conventional railway traffic between the Netherlands and Belgium increased considerably, in part because of lower prices.

²² The Cologne to Frankfurt extension of the Thalys network had to be abandoned because Germany's 15 kV voltage system proved insufficient. Moreover, the technical standards used for the Cologne to Frankfurt railway track were not compatible with the other parts of the network.

²³ Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system.

periods which are typically a few years after adoption, acknowledging the need for time to achieve appropriate technical adjustment.

The technical standard for the Thalys high-speed railway tracks are defined by several simple key parameters, such as a maximum gradient as well as a minimum radius of curvature. In the case of Thalys these are respectively 4% and 3350 meters. Tracks which do not meet these design parameters are not deemed suitable for high-speed use of 300 km per hour. It is important to note that important German railway lines, such as the one between Cologne and Frankfurt, do not meet this particular standard. Furthermore, for even higher speeds, the gradient would have to be even lower (i.e. 2%) and curvature would have to be based around a minimum radius of 7000 meters. These are the specifications used for the new high-speed link currently under development in Italy.

3.5.2 Approaches to railway privatization.

Different models of privatization and involvement of private sector operators and equity have been pursued across the EU. Some countries, for example the United Kingdom, have opted for a “vertical separation” with infrastructure, rolling stock and ancillary businesses sold or franchised to private sector operators. Further, there has been “horizontal separation” with different private sector operators providing services in separate regions through a franchise arrangement, awarded through competitive bidding. In several EU countries, for example France and Germany, there has been limited vertical separation, although private sector involvement has increased through leasing and subcontracting. In some other EU countries there has been vertical separation, but horizontal integration has been maintained in public ownership (Hulten S, F. Mizutani, J. Preston, and D. Van de Velde, 2000).

Protagonists of vertical separation point to the benefits of allowing non-discriminative access to infrastructure/rail-track and the benefits of competition between providers. However, opponents have been quick to point out that in the UK privatization approach, railway operators may lack commercial incentives to make long-term investment in new rolling stock and rail-track. The pressure on franchisers to be efficient will be limited by the need for public safety. The UK experience has demonstrated that the “own” costs of UK train operators has risen sharply since the Hatfield accident in October 2000.²⁴

Thalys International follows the Franco-German model of vertical integration with horizontal separation: national railways provide services on the same route at lower prices, slower speeds and less comfort. The lesson which the Thalys experience demonstrates is that the vertical separation model does not lead to appropriate levels of investment.

The “re-emergence” of the Great Railways in Europe should be placed in the broader context across the EU where logistic trends for using railways for freight are in principle unfavorable for the railways – hence the passenger segment provides the dynamics of the sub-sector. Overall rail-freight across the EU has declined sharply: while in 1970 as much as 21% of all goods were transported by rail, by the year 2000 this had declined to 8.1% of the total freight market (Henstra et al., 2006, p. 146).

The main trends in European freight and logistics have decisively moved against the usage of rail-freight; these trends may be summarized by the following:²⁵

- outsourcing and vertical disintegration, where vertical integration between producers and logistic providers is increasingly limited; rather specialization is taking place where

²⁴ It has been estimated that train operators “own costs”, excluding rolling stock costs and access charges, increased by almost 50% between 1999/00 and 2003/04 (or nearly 40% on a cost per train km basis). As a result, subsidies to passenger train operators increased sharply (Nash and Smith, 2006). A recent study by using a more comprehensive data set for a large sample of 25 train operators from spanning a ten year period 1996/97 to 2005/06 for the confirms this trend. (Wheat and Smith, 2007)

²⁵ Henstra D. et al. (2007), p.138

specialized companies are able to reap economies of scale. Companies are increasingly concentrating on their core-business and bring in third-party logistic service providers to take care of all aspects of logistics. In the 1990s, the trend in the provision of logistics was characterized by spatial concentration and the moving of warehouses to new EU member states. However, in more recent years that trend has been reversed to some extent.

- product flow scheduling combining high-volume low-costs modes with low-volume high-cost segments, for example combining container shipping with air-freight delivery. This increased usage of “hybrid networks” which can operate in parallel, but not necessarily consecutively, has generally by-passed rail-freight networks, which are not able to cope with the increased requirements. An example is provided by Sony which uses sea-transport with containers for the “predictable” segments of demand and utilizes road and/or air for “unanticipated” peak and excess demands.

Nevertheless, limits to deregulation in the road transport sector appear to have been reached due to the trends of increasing road-pricing and the need for internalization of environmental costs. Hence, road transport unit costs are moving upwards and there is a move to other modes; this should in principle make rail, sea and inland waterway transport relatively more attractive. At present, however, only few of the large logistics service providers “have integrated inter-modal transport into their intra-European service offerings”.

4. THE TEN-E DEVELOPMENT

The establishment of a Trans-European Energy grid has been complex and slow. While interconnectivity of the energy sector was considered important for the EU, member states avoided any attempt at the creation of a real European energy policy. National (often state-owned) energy generation monopolies were generally the norm, which de facto reduced the idea of energy interconnectivity to one of security backup rather than one of an open market and energy efficiency. However, the creation of the internal market and the strengthening of competition policy brought with it a strengthening of the demands by the European Commission for liberalizing the energy sector in the EU. The latest need to reduce CO₂ emissions and increase energy security in Europe has strengthened the European Commission’s hand. The new draft treaty energy is clearly stated as a priority for the EU.

Initial steps concentrated on increasing the interconnection of gas and electricity grids of the members states²⁶ and transparency²⁷. Following these initial, cautious steps, the EU moved towards full liberalization of the energy market from the mid-nineties onwards, resulting in the adoption of two liberalization packages. Recently, a third liberalization package has been presented by the European Commission.

4.1 The first liberalization package

The first concern of the European Commission was the lack of an internal market in energy, and a lack of “interconnectability” between national grids. Two directives were agreed concerning common rules for the internal market in electricity and gas (96/92/EC and 98/03/EC). They contained action plans to identify projects of European interest to finance them. The objective was to fix “a minimum level of competition at member state level by way

²⁶ Council Directive 90/547/EEC of 29 October 1990 on the transit of electricity through transmission grids, followed by the Council Directive 91/296/EEC of 31 May 1991 on the transit of natural gas through grids.

²⁷ The Council Directive 90/337/EEC of 29 June 1990 to improve the transparency of gas and electricity prices charged to industrial end-users was a first attempt to ensure that competition was not distorted in the common market, by introducing energy price transparency. Directive 90/547/EEC on electricity foresaw the interconnection of major European grids so as to increase trade of electricity and transfers between electricity grids and lay down the measures by which the Member states were called upon to facilitate the transit of electricity between high voltage grids.

of common rules while progressively bringing down barriers to cross-border trade.”²⁸ The directives called for the unbundling of production transmission and retail activities of the energy sector. It introduced phase-in periods to allow companies and households to choose their supplier.

In 1998 a similar package was presented for the gas sector, but with longer transition periods and lighter rules on unbundling.

The directives were unable to ensure unrestricted access to the networks and the markets remained highly concentrated. In response the EU presented a second package in 2003, containing new decisions and regulations. The new directives 2003/54/EC on electricity and 2003/55/EC on natural gas considered that “concrete provisions are needed to ensure a level playing field in generation and to reduce the risks of market dominance and predatory behavior, ensuring non-discriminatory transmission and distribution tariffs, through access to networks on the basis of tariffs published prior to their entry into force, and ensuring that the rights of small and vulnerable customers are protected.”²⁹ The directive stipulated the full opening to competition of non household customers by 2004 and for all customers by 2007.

4.2 The second liberalization package

The second liberalization package regulated third-party access (TPA) and published network tariffs, reinforced public service obligations especially for vulnerable customers and introduced monitoring of security of supply. For electricity it also set up mandatory electricity labeling for fuel mix and for selected emissions data. The regulation on cross-border electricity trade provided for common tariff structures (including tariffs for cross-border trade), rules for congestion management and the requirement to provide information on interconnection capacities. The proposed regulation on access conditions to gas networks attempted in a similar way to remove barriers to natural gas trade. It addressed partial or non-compliance with agreed guidelines for a transparent and cost-reflective system for cross-border trade (Egenhofer and Gialoglou, 2004).

4.3 The third liberalization package

Commission reports in 2005³⁰ and an inquiry into energy markets completed in 2007³¹ indicated that the second gas and electricity directives had not yet been properly implemented. Implementation was patchy in many member states, to the benefit of state-run incumbent utilities. These factors allowed for the further continuation of vertically-integrated production and distribution (Atiyas and Núñez-Ferrer, 2007)

The March 2006 European Council Conclusions (7775/1/06, published 18 May 2006) called for “full, effective and transparent implementation of existing legislation” (p.30), making reference to the incomplete implementation of the second liberalization package. The March European Council urged member states to develop regional energy cooperation, notably through adequate interconnection, which would lead to the further development of the EU internal market. EU leaders recognized the need to strengthen cooperation and coordination between regulators and system operators by strengthening the coordinating role at a Community level of the European Energy Regulators Group for Electricity and Gas (ERREG).

²⁸ Egenhofer and Gialoglou 2004, p. 14.

²⁹ Ibid.

³⁰ Communication from the Commission to the Council and the European Parliament, Report on progress in creating the internal gas and electricity market, Brussels, 15 November 2005, COM(2005) 568 final.

³¹ Communication from the Commission, Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors (Final Report), COM/2006/0851 final.

The European Regulators' Group for Electricity and Gas (ERGEG) was established by European Commission Decision 2003/796/EC³² on 11 November 2003. It is an advisory group of independent national regulatory authorities, with the task of assisting the Commission to consolidate the internal market for electricity and gas. Its members are the heads of the national energy regulatory authorities in the 27 member states.

An inquiry into the European gas and electricity sectors was released together with the EU Energy Policy Package on 10 January 2007³³. The inquiry assessed the prevailing competitive conditions and established the causes of the perceived market malfunctioning. The Energy Sector Inquiry identified a number of key areas in which competition was not functioning well: market concentration/market power; vertical foreclosure (most prominently inadequate unbundling of network and supply); lack of market integration (including lack of regulatory oversight for cross-border issues); lack of transparency, price formation, downstream markets, balancing markets, and liquefied natural gas (LNG). It called for urgent action in the following four areas: (1) achieving effective unbundling of network and supply activities; (2) removing regulatory gaps (in particular for cross-border issues); (3) addressing market concentration and barriers to entry; and (4) increasing transparency in market operations.³⁴

In parallel with the inquiry the European Commission also published a communication on prospects for the internal gas and electricity market³⁵ in which it set out its intentions concerning regulatory proposals to be made in order to address the shortcomings uncovered by the Inquiry and previous reports. The European Commission considers it necessary to tackle two main elements in the forthcoming third legislative package: (1) strengthen the powers and independence of the energy regulators, to allow for the proper and efficient regulation of cross-border issues relating to gas and electricity network access; and (2) push for ownership unbundling, recognizing that the legal and functional unbundling of network operators that are vertically integrated with production and supply activities is by itself not sufficient to ensure equal access to the networks for all suppliers.

4.4 Infrastructure and electricity exchange markets

To ensure that interconnectivity and a real energy market exist a set of priority projects in the energy sector were decided in 1994 and 1996 and expanded subsequently in the 2003 and 2007 energy packages. Figures 3 and 4 present the electricity and gas priority projects respectively.

In 2006 European Parliament and Council Decision 1364/2006 on gas and electricity identified the following projects. Figures 4 and 5 show their location.

Electricity	Gas
9 major axes	6 major axes
164 projects of common interest	122 projects of common interest
32 Projects of European interest	10 projects of European interest

³² 2003/796/EC: Commission Decision of 11 November 2003 on establishing the European Regulators Group for Electricity and Gas, OJ L 296, 14.11.2003, p. 34–35

³³ Communication from the Commission to the Council and the European Parliament, "An Energy Policy for Europe", COM(2007) 1 final, Brussels, 10 January 2007.

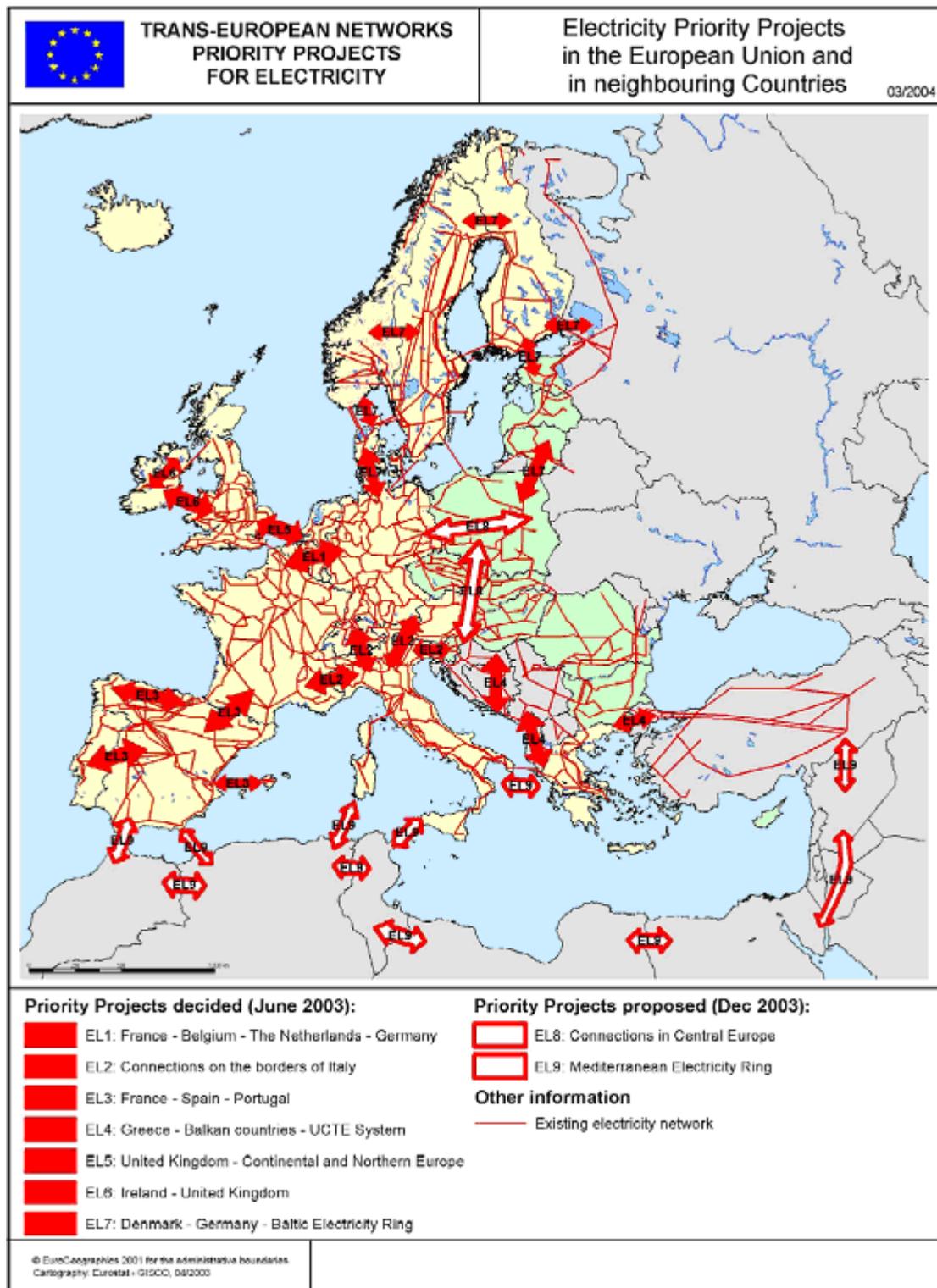
³⁴ Communication from the Commission, "Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors (Final Report)", COM/2006/0851 final, Brussels, 10 January 2007.

³⁵ Communication from the Commission to the Council and the European Parliament, "Prospects for the internal gas and electricity market, COM(2006) 841 final, Brussels, 10 January 2007.

The axes are composed of a number of the priority projects. The projects of European interest are considered crucial for the network and of major priority. The cost of these projects was estimated at a total of €23 billion, with electricity mainly consisting of short-distance cross-border connections and for gas long-distance pipelines to third countries and liquefied natural gas ports and storage. The projects include for electricity not only connections but also the development and linkage of renewable energy projects.

A recent comprehensive review of progress in developing networks (MVG Consulting, 2007) is fairly critical of the situation, with many projects being delayed unless the infrastructure is in the national interest. There is no legal requirement to prioritize EU infrastructure developments to national projects. As a result, implementation is patchy. Interconnectivity is generally only developed as a national energy security backup, but not a real market exchange. Only the Nordic countries have sufficient capacity to be considered a real electricity exchange market, in which energy is traded freely with free market pricing.

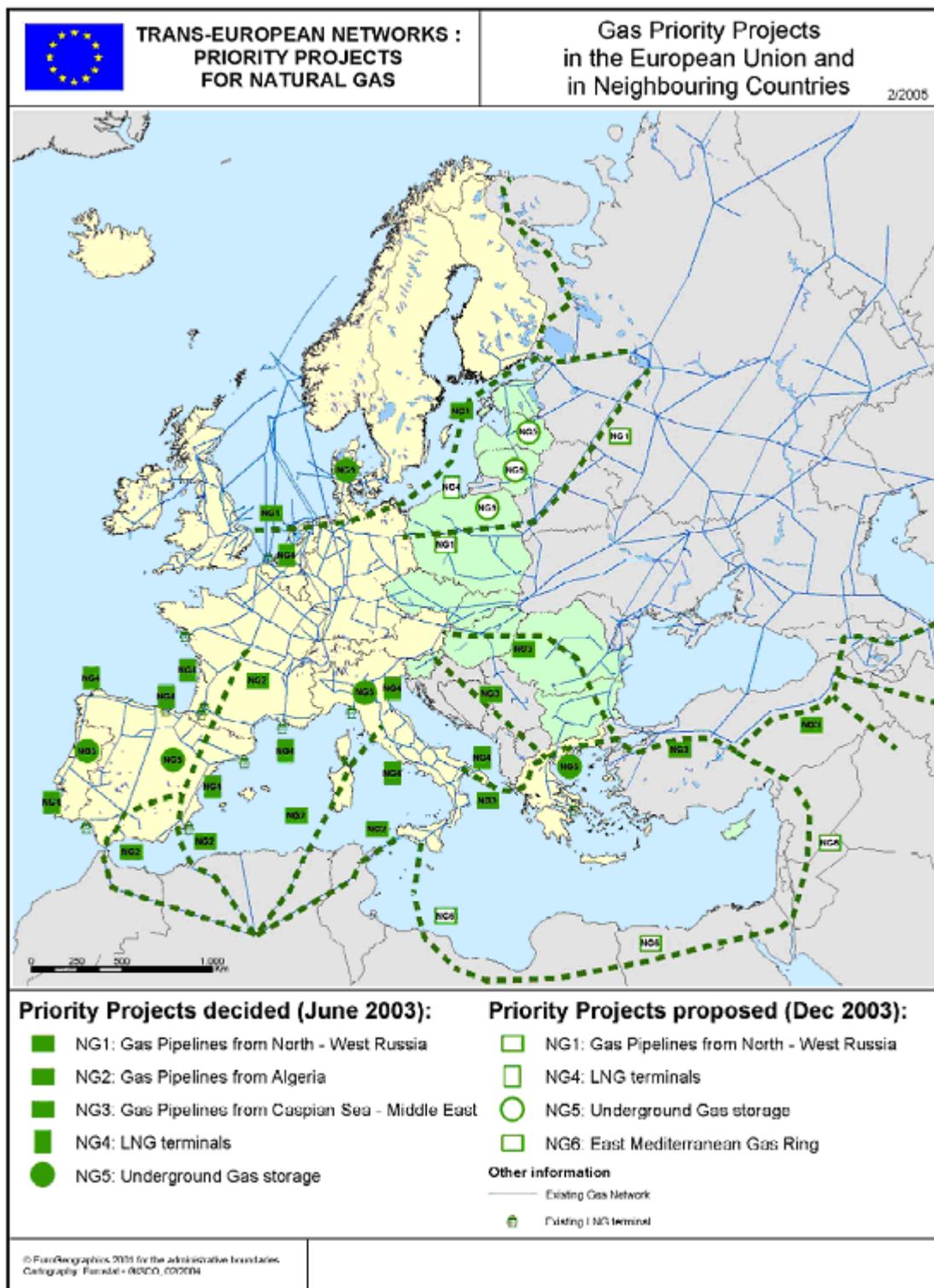
Figure 3: Electricity Priority Projects



Source: European Commission 2007.

http://ec.europa.eu/ten/energy/studies/doc/2006_09_19/pp_electricity_en.pdf

Figure 3: Gas Priority Projects



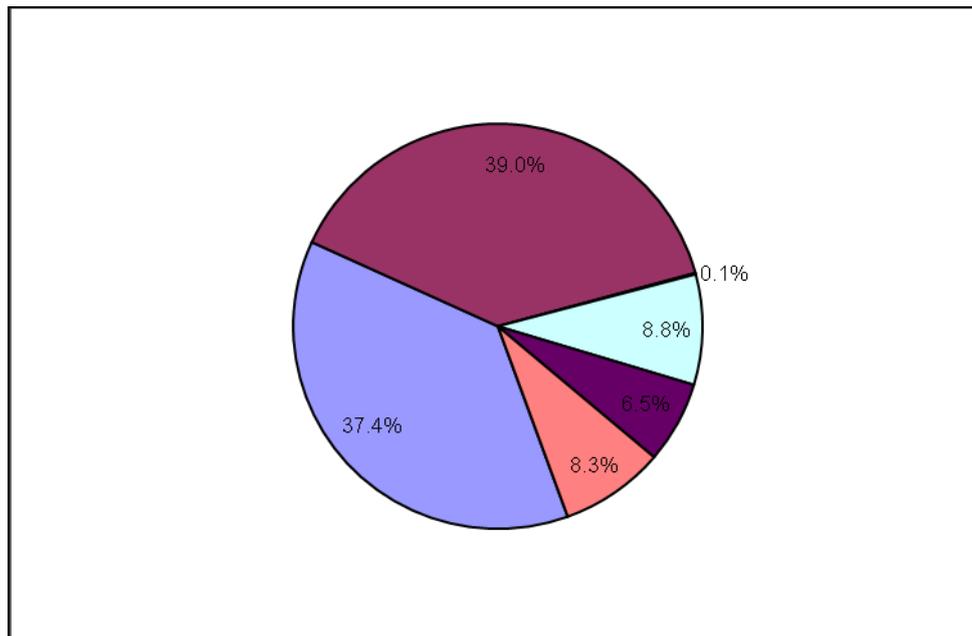
Source: European Commission 2007

http://ec.europa.eu/ten/energy/studies/doc/2006_09_19/pp_gas_en.pdf

Financial sources for the development of the electricity grid have been varied. Figure 5 presents a breakdown. The sources have been EIB loans, other EU funds (EBRD loans; structural and cohesion funds), TEN-E funds, other bank loans and TSO equity (CESI et al., 2005). Funding from the TEN budget has been limited and mainly for feasibility studies. The average investment per year in the EU plus candidate countries (30 countries) has been of

€3 billion. Only 4% of the investment has been directed to cross-border projects, generally high-voltage lines.

Figure 5: Financial Sources for the Development of the Electricity Grid



Source: European Commission 2007.

Investment in the gas transmission network has been stable at an average of €2.6 billion a year from 1990 to 2004. Financing has benefitted from EU loans and grants. This includes investments in TSO internal national gas transmission systems, excluding investments in gas storage, LNG terminals, import pipelines and new interconnectors such as the one between the UK (Bacton) and Belgium (Zeebrugge).

5. THE E-TEN

The trans-European networks for telecommunications have had a different objective to transport and energy. Two aspects are of relevance, the liberalization of telecommunications and improvements in the coverage of broadband internet. The eTEN has had as an objective to improve the provision of online services in general.

The cross-border infrastructure role of the eTEN was limited as telecommunication networks were already quite advanced. Thus the bulk of interventions have fallen on reaching remote areas and improving service. Now the eTEN has mutated to a new program, the i2020 The trans-European networks for telecommunications program came to an end in 2006, even if some projects were only completed in 2009.

6. CONCLUSIONS AND LESSONS FROM THE EU

This paper has highlighted the development of the EU and the origins and driving forces for transnational infrastructure development. Ever since the creation of the European Communities in 1957, the realization of a single common and integrated market has been a central goal. This single market was considered important to guarantee peace and foster economic prosperity. The treaties of the EU established as a goal four freedoms: freedom of movement of goods, persons, services, and capital.

EU development and management of transnational infrastructures are part of the EU's effort to improve the single market, as part of a set of policies which foster integration and compensate for possible adverse effects (Common Agricultural Policy, Regional Policy). The EU's role in the development of transnational infrastructure through the development of Trans-European Networks is rather recent, as it was increasingly clear that market mechanisms alone would not guarantee their development, while member states were hesitant in allowing increased access of goods and services into their markets.

With the Treaty of Maastricht in 1992, the European Commission and the European Investment Bank have had a clear mandate to foster their development. The large costs and the lack of commitment of national governments have required the creation of particular institutions to bring transnational projects to fruition. Not only does the EU provide some limited grants for their development, but generous loans by the EIB and the appointment of influential political mediators have given some impetus to the creation of those infrastructure projects.

The document highlights clearly that the political support of the countries affected and the institutional setting are as or even more important than the financial aspect. In fact, for many cross-border infrastructure projects, EU financial grants are relatively minor (10% of the costs). The role of the EIB has often been important, however, as it has assisted in developing high-quality projects through its participation and its experience. The EIB has been pivotal by offering loans at favorable terms and attracting other private financing through PPPs.

Finally, the history of the EU's transnational infrastructures clearly points to the need for strict guidelines for the selection of projects. These need to be drafted and agreed at a supranational level with the close participation of the relevant governments. For this, the existence of solid intergovernmental institutions (Council of the EU), a supranational administration (The European Commission) and clear treaties defining the terms of collaboration have been clearly important facilitators. However, they are not necessary preconditions for the creation of cross-border infrastructure.

The paths of regional cooperation and integration that may be followed in Asia (and elsewhere), and in particular the role of cross-border infrastructure may differ fundamentally from the European experience. In the case of the EU, the need for financial support for trans-national infrastructure development accelerated in the context of the EU's enlargement, with new member states having lower per capita incomes and less developed infrastructure. In that context, the emphasis of regional policy shifted from agriculture, rural support and employment to the facilitation and support for infrastructure development. The path which Asia may follow could have a different sequence; there is no legal, political or economic necessity for customs union or common market integration to precede infrastructural cooperation.

This discussion paper observes that the EU experience shows that the creation of cross-border infrastructure was significantly facilitated through a limited number of specific process and project innovations, facilitating regional cooperation and the capturing of positive spill-over effects from this. These include (i) the setting up of a High-Level Group to prioritize cross-border infrastructure projects, (ii) the appointment of coordinators, with political influence, to enforce commitments made and (iii) the comprehensive provision of technical assistance to ensure similar evaluation methods and criteria, drawing on cost-benefit analysis and multi-criteria assessment, as well as ensuring interoperability through the use of common technical and administrative standards for design, operation, customs valuation, etc. Within the Asian context, these "honest broker functions" can be filled by multi-lateral institutions, including the Asian Development Bank and the UN ESCAP. Most pertinently, none of these process and project innovations necessarily require the "deep integration" which characterize the EU today.

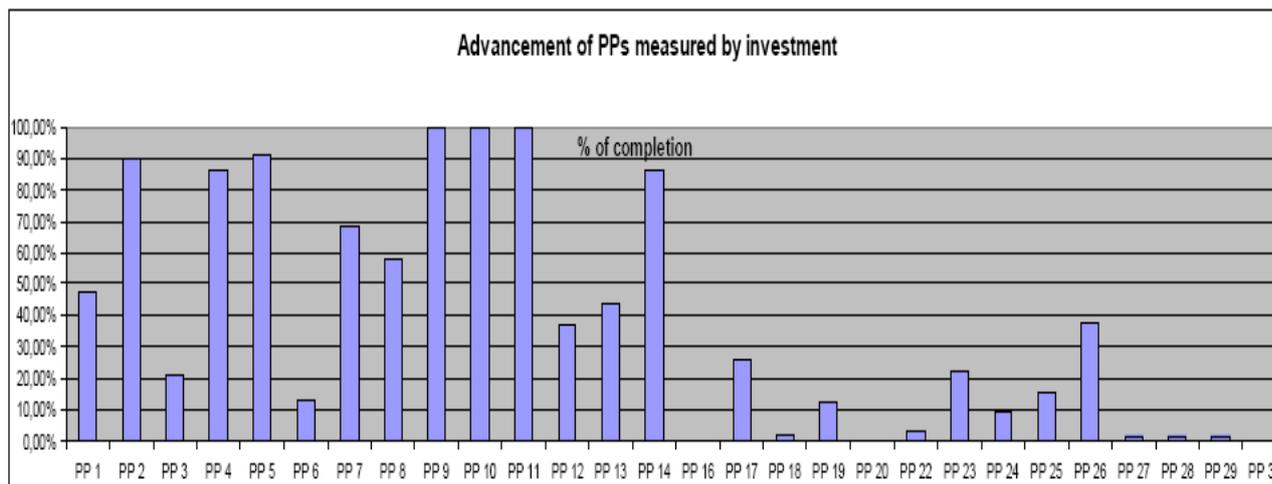
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- Companies Cost and Efficiency Trends 1996 to 2006: Lessons for Future Franchising Policy, Paper presented to European Transport Conference, Annex 1. Advancement in the completion of the TEN-T.

APPENDIX: ADVANCEMENT IN THE COMPLETION OF THE TEN-T

Advancement Measured in Level of Necessary Investment by 2007



Source: European Commission (2008b), p.6

Implementation of priority axes, completed and expected

Priority axis	MSs involved	Date set for completion	Total cost in M EUR	Investment before 2007 in M EUR Total	Total committed 2007-2013 in M EUR	Remaining investment in M EUR after 2013
PP1 Railway axis Berlin-Verona/Milan-Bologna-Napels-Messina-Palermo	AT, IT, DE	2024	47.054,61	22.370,53	14.285,63	10.398,45
PP2 High-speed railway axis Paris-/Brussels-Cologne-Amsterdam-London	BE, DE, NL, UK	2015	18.848,01	16.954,61	1.857,07	36,33
PP3 High-speed railway axis of south-west Europe	ES, FR, PT	2020	50.656,68	10.556,20	26.782,65	13.317,83
PP4 High-speed railway axis east	FR, DE	2013	5.255,00	4.521,60	590,60	142,80
PP5 Betuwe Line	NL	2008	4.776,40	4.361,00	415,40	0,00
PP6 Railway axis Lyon-Trieste-Divaca/Koper/ Divaca-Ljubljana- Budapest-Ukrainian border	FR, HU, IT, SL	2025	60.741,96	7.827,03	10.427,94	42.486,98
PP7 Motorway axis Igoumenitsa/Patra-Athina-Sofia-Budapest	BG, GR, RO	2020	14.928,70	10.051,10	4.727,60	150,00
PP8 Multimodal axis	ES, PT	2017	15.324,5	8.882,71	4.752,97	1.688,86

Portugal/Spain-rest of Europe			4			
PP9 Railway axis Cork-Dublin-Belfast- Stranraer (COMPLETED)	IRL, UK	2001	357,00	357,00	0,00	0,00
PP10 Malpensa Airport (Milan) (COMPLETED)	IT	2001	1.344,00	1.344,00	0,00	0,00
PP11 Öresund fixed link (COMPLETED)	DK, S	2001	4.158,00	4.158,00	0,00	0,00
PP12 Nordic triangle railway-road axis	FIN, S	2016	11.746,3 7	4.364,40	5.705,37	1.676,60
PP13 UK- Ireland/Benelux road axis	IRL, UK	2015	7.526,44	3.285,65	4.057,80	182,99
PP14 West Coast Main Line	UK	2009	12.629,2 4	10.896,37	1.732,87	0,00
PP16 Freight railway axis Sines/Algeciras- Madrid-Paris	ES, PT	2020	8.899,04	48,80	1.100,34	7.749,90
PP17 Railway axis Paris-Strasbourg- Stuttgart-Vienna- Bratislava	AT, FR, DE, SK	2020	13.563,2 9	3.528,68	6.779,99	3.254,62
PP18 Rhine/Meuse- Main-Danube inland waterway axis	AT, BE, BG, DE, HU, NL, RO	2016	2.103,28	45,29	1.075,55	982,44
PP19 High-speed rail interoperability on the Iberian peninsula	ES, PT	2020	41.770,4 5	5.236,30	33.194,37	3.339,78
PP20 Fehmarn Belt railway axis	DE, DK	2018	7.930,70	36,72	2.680,50	5.213,48
PP22 Railway axis Athina-Sofia- Budapest-Vienna- Prague- Nürnberg/Dresden	AT, BG, CZ, DE, GR, HU, RO	2020	12.641,8 0	465,36	5.618,52	6.557,92
PP23 Railway axis Gdansk-Warsaw- Brno/Bratislava- Vienna	CZ, PL, SK	2017	6.159,17	1.384,42	3.296,22	1.478,53
PP24 Railway axis Lyon/Genoa-Basel- Duisburg- Rotterdam/Antwerp	BE, DE, FR, IT, NL	2020	22.647,2 9	2.103,69	5.421,19	15.122,41
PP25 Motorway axis Gdansk- Brno/Bratislava- Vienna	AT, CZ, PL, SK	2017	6.845,96	1.063,50	5.782,46	0,00
PP26 Railway-road axis Ireland/United Kingdom/continental	IRL, UK	2020	6.242,82	2.356,39	2.473,43	1.413,01

Europe						
PP27 Rail Baltica axis Warsaw-Kaunas-Riga- Tallinn-Helsinki	EE, LT, LV, PL	2020	3.198,19	50,00	1.556,19	1.592,00
PP28 Eurocaprail on the Brussels- Luxembourg- Strasbourg railway axis	BE, LUX	2013	1.183,19	18,76	1.083,23	81,20
PP29 Railway axis of the Ionian/Adriatic intermodal corridor	GR	2019	4.308,00	81,00	1.074,00	3.153,00
PP30 Inland waterway Seine-Schelde	BE, FR	2016	4.422,41	21,31	4.097,70	303,40

Source: European Commission 2008.