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Three Target Sectors for a European Investment Strategy

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While the president of the European Commission is getting ready to present the "Juncker package" announced in July 2014, to revive activity in Europe through investment, what are the sectors in which these investments may be concentrated?

The overall analysis of investment gaps in the euro zone[1] has confirmed the requirement for a European macroeconomic revival effort that involves investment, public or private, undertaken very quickly, even though this diagnosis varies depending on the country.

The drivers of a European investment strategy[2] are fiscal, regulatory and financial and are based on the selection of projects for the future.

This third *Note d'analyse*** addresses the topic of investment potential in three key sectors: transport, energy and the digital sector, for which the amount of additional investment could reach €120 billion per year and thus, over three years, be higher than the forecasts in the Juncker plan. This maximalist amount mainly corresponds to the implementation of an ambitious energy-climate policy.

Given current budgetary constraints, carefully selecting the desired investments, for which their social utility must be validated, is imperative: socioeconomic evaluation is the appropriate approach, particularly for taking into account the environmental externalities that now justify significant investments in the ecological transition.

Investment potential (in billions of euros per year)

	European Union			Germany	France
	Trend amount	Feasible amount	Variance	Variance	Variance
Energy	156	240	84	31-39	2-12
Energy efficiency	*35*	*89*	*54*	*10-15*	
Production and network	*121*	*151*	*30*	*21-24*	
Transport	48	70	22	10	1-3
Digital infrastructures	42	53	11	1	1
Total	**246**	**363**	**117**	**42-50**	**4-16**

Sources: European Commission, DIW (Berlin), calculations from France Stratégie.

* Sustainable development Department
** English version of « Trois secteurs cibles pour une stratégie européenne d'investissement », *La Note d'analyse,* n°18, November 2014

1. "Has there been an investment gap in France and Europe since 2007?", English version, *La Note d'analyse* n°16, September 2014, www.strategie.gouv.fr.
2. "The levers of a European investment strategy", English version, *La Note d'analyse* n°17, November 2014, www.strategie.gouv.fr.

INTRODUCTION

The diagnosis of the investment gap in the Eurozone differs depending on the countries[3]. While those in the south of Europe are experiencing a marked decline in investment, both public and private, Germany has preserved its overall level of investment, but suffers from chronic public under-investment. In France, on the contrary, public investment is being maintained, but the country lacks sufficient productive investment to stimulate medium-term growth.

This *Note d'analyse* examines what would be an effective revival of investment under the European programme announced on 15 July by Jean-Claude Juncker. As shown in the previous *Note d'analyse*[4], a lack of aggregate demand requires a European effort towards macro-economic stimulus through public or private investment, undertaken in the short term.

The challenge for this revival strategy is to direct funding towards socially-useful investments, meaning those that fulfil the objectives of public policy, particularly concerning the fight against climate change.

This *Note d'analyse* reviews the investment potential in infrastructure in the broad sense, particularly transport, energy and the digital sector, which are essential to strengthen the competitiveness, as well as to achieve the objectives of combating climate change.

INFRASTRUCTURE, THE PREFERRED INVESTMENT TARGET

According to Eurostat[5], the energy sector in Europe invests, each year, around €100 billion, the transport sector invests €200 billion and telecommunications invest €50 billion (table 1). The breakdown of public investment by function[6] suggests that, in energy and telecommunications, the share of public investment is limited, while it has reached more than 30% in transport.

At the European level, investment in infrastructure is primarily sustained by the Connecting Europe Facility (CEF) which, in the European budget voted in December 2013, was allocated an overall budget of €33.2 billion for the period 2014-2020, representing a little under 5 billion per year. This funding, which is low if we relate it to the total amount of investments presented in table 1, aims at significant leverage effects, both through the contributions from the public budgets of Member States and also through private funding mobilised using various financial instruments. Thus, in the transport sector, the CEF expects a leverage effect from funding by Member States of a factor of 5 and a factor of 20 on those of private operators.

Table 1
Investment in the European Union for the energy, transport and telecoms sectors
(in billions of Euro, 2012)

	Energy	Transport	Telecom	**Total**
GFCF	95	208	47	351
GFCF / GDP	**0,7%**	**1,6%**	**0,4%**	**2,7%**
Public investment	2	67	2	72
Public investment/GFCF*	**2%**	**32%**	**5%**	**20%**

* Public investment is given in the breakdown by sector, by gross capital formation. The associated amounts partially cover the GFCF for each branch.
Source: Estimate by France Stratégie, from Eurostat data.

This breakdown must be qualified. Indeed, a recent study by CDC Climat on investments related to the fight against climate change[7] showed that, in 2011, about €20 billion of investments went into greenhouse gas reduction, including 5 in the energy industry, 7 in transport, as well as 13 in the building industry and agriculture sectors. A large share of investment related to the energy transition is thus accounted for in other sectors, mainly in the energy renovation of buildings.

IDENTIFYING THE POTENTIAL FOR ADDITIONAL INVESTMENT

The transport sector

In 2011, the European Commission published its White Paper on transport[8] announcing a programme of investment to improve infrastructure as part of the trans-European transport network (TEN-T). The latter aims to break the dependency of the transport system on oil without sacrificing its efficiency or compromising mobility. An overall budget of about €500 billion by 2020 has been identified by the Commission, about half of which to invest in dealing with the main bottlenecks.

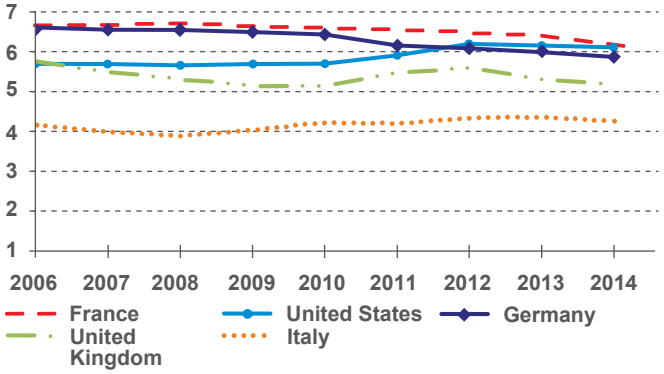
3. See *La Note d'analyse* n°16, *op. cit.*
4. See *La Note d'analyse* n°17, *op. cit.*
5. Gross fixed capital formation (GFCF), broken down according to the Statistical Classification of Economic Activities in the European Community (NACE).
6. Breakdown of public expenditure according to the classification of the functions of the government (COFOG).
7. Morel R. *et al.* (2014), *Panorama des financements climatiques en France en 2011*, rapport, CDC Climat Recherche, October.
8. European Commission (2011), *White Paper on transport*.

In a recent publication[9], the Commission recognised a gap in funding to fulfil the objectives set in TEN-T[10] because the forecasts sent by the Member States stand at a total of only €340 billion over the period 2014-2020. It expresses concern about the consequences of this under-investment in relation to the objectives of TEN-T, particularly the consequences for competitiveness, environment and security.

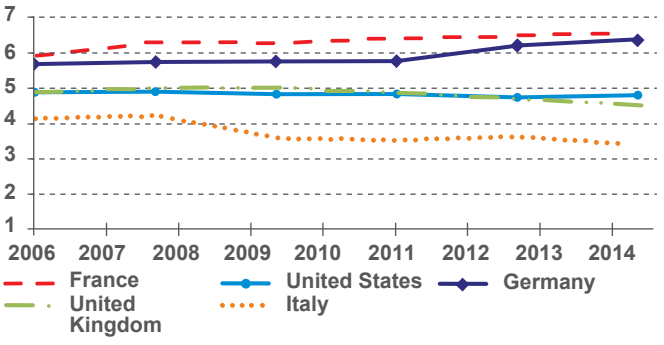
A reduction in the quality of infrastructure has occurred in France and Germany (graph 1), with France nevertheless remaining one of the countries where the quality of infrastructure is perceived as the best.

The investment deficit observed in relation to the TEN-T objectives, of about €160 billion, corresponds to nearly 22 billion per year, over seven years.

Graph 1
Perception of the quality of roads*



Perception of the quality of rail infrastructure*



* Score from 1 to 7.

Source: The Global Competitiveness Index Historical Dataset. Surveys by the *World Economic Forum* amongst investors. © 2005-2014 *World Economic Forum*.

The case of France

In the transport sector, the *Mobilité 21 report*[11] scrutinised the socio-economic evaluation of all of the projects planned in the national transport infrastructure plan (SNIT). It stressed the priority to be given to maintaining and modernising the existing infrastructure, as well as to projects for developing sustainable urban transport.

It defined two scenarios for first-priority large construction projects by 2030. In scenario 1, the overall budget allocation by 2030 is from 8 to €10 billion. In scenario 2, from 28 to 30 billion. Bearing in mind that scenario 1 corresponds to the reference investment plan and scenario 2 corresponds to an ambitious plan for useful investments, the supplement of €20 billion by 2030 would correspond to supplementary investment of about €1.2 billion per year. These annual amounts could be increased over the next three years, if it were possible to accelerate the projects that have already been decided or that are well advanced as regard formal consultations and prior studies.

The case of Germany

In Germany, the DIW[12] has identified a much greater backlog of about €10 billion per year for the maintenance and replacement of existing infrastructure, catching up for past underinvestment and for extending networks, particularly for railways and internal navigable waterways.

The energy sector

At the beginning of 2014, the European Commission proposed a framework for "climate and energy" policies over the period 2020-2030. This framework was supplemented by a communication dedicated to energy efficiency, which presented an assessment of various energy-efficiency scenarios. The impact study[13] stresses that an objective of improving energy efficiency by 30%[14] would reduce the European gas bill by 26% compared to the reference scenario and reduce oil imports by 4%. Macro-economic benefits would also be expected from an increase in investment in energy renovation.

In total, the "energy and climate" objectives proposed would lead to an average increase in investment of €90 billion per year, over the period 2011-2030, compared to the reference scenario.

9. European Commission (2014), "Attracting Investments, Towards Transport Infrastructures", September.
10. €26.3 billion was voted in December 2013 in the European budget and must be supplemented by funding from Member States (for about 70% of the total costs), as well as private funding.
11. Duron Ph. (2013), Mobilité 21, *Pour un schéma national de mobilité durable*, report to the Ministry of transport.
12. Fratzscher M. (2014), *Die Deutschland Illusion*, Carl Hanser Verlag.
13. European Commission (2014), Impact assessment accompanying the document "Energy Efficiency and its contribution to energy security and the 2030 Framework for climate and energy policy", COM(2014) 520.
14. During the meeting of the European Council on 23 and 24 October 2014, the heads of state and government agreed a reduction in greenhouse-gas emissions of at least 40% by 2030; this agreement specified a minimum increase of 27% in energy efficiency and the prospect of going up to 30%, which will be re-discussed by 2020.

Energy efficiency

A large part of the investment under this scenario concerns the energy renovation of buildings. According to the impact study, for the European housing estate, the amount of investments should be more than doubled and reach €56 billion per year, in a scenario where the improvement of energy efficiency is 30%. In the service sector, particularly the public estate, investments should triple, up to €27 billion per year. Lastly, €6 billion annually will be devoted to energy efficiency in industry, bringing the total investments in energy efficiency to €89 billion per year, against €35 billion in the reference scenario.

Energy production

According to the latest assessment by the European Commission, climatic or energy-efficiency targets should lead to limiting the requirements for investment in power generation. Thus, a target of improving energy efficiency by 30% would reduce electricity requirements by 9% by 2030 compared to the reference scenario. The overall investment requirement would increase by about €15 billion per year because the climatic ambition would lead to a preference for more capital-intensive sources of power to replace carbon-based power sources.

The infrastructure for transporting and storing gas and electricity

The Commission estimates that about €200 billion of investment for the period 2014-2020 will concern the infrastructure for transporting and storing gas and electricity, half of which, representing €100 billion, may not be released due to obstacles related to the acceptance of facilities by the populations concerned and the issue of permits, and related to the regulations and to funding. This amount corresponds to an investment deficit of about €15 billion per year. However, the drop in energy consumption, particularly gas, expected from the more ambitious energy-efficiency policies, could lead to a review of whether certain energy transport infrastructure projects are appropriate.

The case of France

Detailed evaluations are not available for the French energy sector. The national debate on energy transition led to estimates of additional investments of between 2 and €12 billion per year, over the period 2014-2030, compared to the investments made in 2012[15]. These evaluations should be updated with regard to the new targets specified in the Energy Transition Act, which has just been adopted by the French National Assembly.

The case of Germany

The implementation of the energy transition in Germany (*Energiewende*) is leading to an increase in investments that the DIW estimates at between 31 and €38 billion per year by 2020. These investments would be made in the production of electricity and heat (€18 billion per year), in electrical networks, particularly for the integration of intermittent renewable energies (total amount estimated at 7 billion per year) and lastly in the energy renovation of buildings, for an additional €13 billion per year.

The digital sector

This sector is an essential driver of growth due to its potential for innovation and its application to all economic activities. The digital strategy for Europe has set itself the objective of covering the territory with broad-band connection services, both fixed and mobile. These deployments are based largely on private investment, induced by competitive mechanisms within an appropriate regulatory framework, which does not exclude the significant use of public funds for coverage in unprofitable zones. In 2013, the rates of coverage of ultrafast broad-band connections (>30 Mb/s) was 62% in Europe (41% in France), against 100% expected in 2020. Concerning mobile access, 4G coverage is 59% of the population in Europe (68% in France). The deployment of ultrafast broad-band networks (> 100 Mb/s), particularly *via* optical fibre, was still in its infancy in 2013, with a number of subscriptions corresponding to 1.6% of the population in Europe (2% in France) against 50% targeted in 2020[16].

Concerning mobiles, the obligations for coverage are mainly set through the radio-spectrum usage licences, which allows coverage obligations to be increased to the detriment of the price at which the licences are granted. Concerning the deployment of fixed ultrafast broad-band networks there is, however, great geographical disparity, leading to the existence of unprofitable zones of low density, which assume intervention by the public authorities to provide the funding.

An article published in 2011 by the European investment bank (EIB)[17] estimates the cost of generalised deployment of optical fibres to subscribers (FttH) at the European scale to be €209 billion, of which 65 to 100 billion would

15. Leclair B., Orphelin M., Rozier Ph. *et al*. (2013), *Quels coûts, quels bénéfices et quel financement de la transition énergétique ?*, Report from the working group to the National council for the debate on the energy transition.
16. Source: European Commission, "Digital roadmap".
17. Hätönen J. (2011), "The Economic Impact of Fixed and Mobile High-Speed Networks", *EIB Papers*, Vol. 16, n°2.

be commercially profitable investment. Over ten years, the result is a requirement for public investment of €11 billion, taking the high assumption on commercial profitability.

In France, the investment necessary to reach coverage of the entire territory by fixed ultrafast broad-band is estimated at €20 billion by 2022[18]. It will be partly made by private operators in profitable dense zones and partly with the support of public funds for less dense zones. The coverage of profitable zones assumes investment of approximately 7 billion. In unprofitable zones, part of the funding should be provided by the operators' royalties (approximately 3 billion) and part by public funding from the state (3 billion). So there remains about €7 billion of expenditure to be financed, representing €1 billion per year.

In Germany, the federal government has not provisioned financial support to the coverage of the territory which may be paid for by the Länder. Bavaria has thus planned funding of €2 billion for broad-band. Brought to the national scale and spread over ten years, this amount would translate to a public investment requirement estimated at €1 billion.

The investment potential in these three sectors

These sectoral analyses show a total investment potential for infrastructure higher than €100 billion per year, based mainly on the investments required for the energy transition (table 2). It should be noted that this is an annual average over separate periods, according to the sectors.

Table 2
Investment potential (in billions of euros per year)

	European Union			Germany	France
	Trend amount	Feasible amount	Variance	Variance	Variance
Energy	156	240	84	31-39	2-12
Energy efficiency	*35*	*89*	*54*	*10-15*	
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Sources: European Commission, DIW (Berlin), author's calculations.

HOW TO SELECT INVESTMENTS

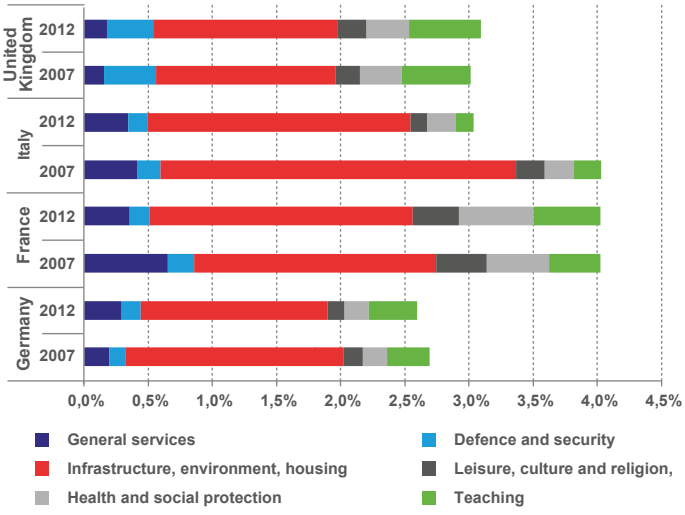
The extent of the envisaged projects, combined with possible alternatives and the uncertainties that were emphasised for various sectors, show the importance of implementing a rigorous selection of projects.

In particular, one should not be deceived by the particularly low level of interest rates, which would lead to believe that any project can be financed. Given the extent of accumulated public debt, it is essential to select projects that are useful, meaning those for which the discounted benefits are higher than the costs. In particular, the temptation must be avoided to provide infrastructure for which the future maintenance costs will be likely to put an even greater burden on the limited budgetary headroom that will be available.

The utility of the socio-economic evaluation

This assumes that the public authorities will select investments, as a priority for countries such as France where public investment expenditure[19] is already high (graph 2).

Graph 2
Public investment expenditure in several European countries (as % of GDP)



Source: France Stratégie, based on Eurostat.

Economic theory supplies a criterion for assessing the utility of an investment: its socio-economic profitability, which can ensure that the envisaged investment has long-term benefits that are greater than the investment cost, including external effects (impact on health, environment, etc) beyond just the financial profitability of the project. The use of the socio-economic evaluation can select, from amongst projects having a short-term revival effect, those that are the most socially useful and that have benefits for long-term growth.

18. France ultrafast broad-band plan, February 2013.
19. Public investment expenditure mainly covers direct investment expenses (gross capital formation) and equipment subsidies (capital transfers). The latter represents about 20% of public investment expenditure in France and 40% in Germany.

The socio-economic evaluation method

In France, socio economic evaluation of investments is part of a long tradition, driven in particular by France Stratégie[20]. It is based on the use of a discount rate corresponding to an interest rate that can not only value direct financial flows (income and costs), and therefore financial profitability, but also the positive and negative externalities for the community. The project will only be undertaken if its total value is sufficient.
This evaluation is based in particular on "shadow prices" (meaning prices fixed by the public authority) for different non-monetary characteristics of an investment project (statistical value of human life or the value of carbon, inclusion of biodiversity).
Such a method, historically developed for evaluating projects in the transport sector, can be applied to other sectors. The extent of the verifications requested must be proportionate to the scale of the project. Lastly, the governance of the evaluation must be well defined, as far as possible ensuring transparency on the data and assumptions, sensitivity analyses of the results and an independent second opinion.

The risks attached to a wrong investment choice

The strategy to revive investment is not without risks[21]. Based only on public investment, it may lead to carry out programmes that have not been undertaken until now because of their low socio-economic yield: this is the risk of financing only white elephants, grandiose projects, the cost of which would strongly increase public debt.

The political will to quickly undertake these investments may also lead to making wrong technological choices, if these are developing rapidly. One of the issues includes seeking the best understanding of technological uncertainty in sectors that are changing[22]. To avoid concentrating too much effort on the wrong technologies, it is important to carry out sensitivity tests on prior evaluations so as to favour "no regret" solutions and try to quantify the value of the option consisting of deferring the investment.

The instruments for selecting investments

The French Budget Planning Act (LPFP - Loi de programmation des finances publiques) of 31 December 2012 established, for all civil investment projects financed by the state, a requirement for a prior socio-economic evaluation. It also specifies a prior independent second opinion given by the Commissariat general for investment when the total amount of the project exceeds a threshold of €100 million. This process deserves to be extended to local authorities and at the European level. The procedures for a second opinion put in place in France could thus be transposed to the European level to accompany the implementation of the envisaged investment programme.

How to trigger investment

The increase in investment identified is not intended to be only financed by public money.

In network infrastructure (energy, rail, and digital) a large part of the investment is made by the operators, whether they are public or private, and mostly financed by the price of associated services to users. Nevertheless, public service objectives may lead to different procedures for intervention, public-service funds, subsidies or guarantee arrangements, with the public authority covering a share of the risks involved. The purchase prices for renewable energies are an example of a mixed arrangement for subsidy and guaranteed remuneration, paid by users through a public service fund, which has led to stimulating, outside the constraints of public funding, very significant investments, up to €84 billion of investments in Europe, in 2011. Such instruments can play a positive role in triggering private funding but must also be regulated to avoid free riding, wasting public money or imposing exorbitant costs for users.

Various mechanisms for contracting, funding and guarantee can associate private financing, for example concessions for road infrastructure or energy performance contracts for the renovation of buildings.

Lastly, certain levers can promote an acceleration of investment in all of these sectors, including:

- standards, the tightening of which can lead to downgrading part of the capital stock; standards concerning local polluting emissions for power stations; standards covering emissions from vehicles travelling in certain urban zones; the obligation for energy performance when major renovations are undertaken;
- the price signal, like the taxes on energy or the market for trading carbon quotas which, by including externalities (mainly environmental), provide an incentive to invest to reduce them. A rapid increase in the price signal can lead to the immediate downgrading of capital stock in the case where it makes existing equipment and infrastructure less profitable than immediately replacing them by more efficient equipment.

20. See "Socio-economic assessment", mimeo on www.strategie.gouv.fr.
21. See *La Note d'analyse* n°17, *op. cit*.
22. As an example, optical fibres are appropriate for the deployment of ultrafast broad-band connections in dense zones, but other technologies may be envisaged in zones of low density.

Achieving such significant investment growth as envisaged *via* the energy-climate policy requires a radical change to players' expectations concerning the development of energy prices, and particularly the price of CO_2, and the gains achieved through for investments in energy.

To ensure the deployment of ultrafast broad-band infrastructure, the main tools for extending territorial coverage consist of subsidies, which may be direct or in the form of an improvement in funding conditions. The control of public finances makes it necessary to limit subsidies to the non-profitable part of the deployment. Also, avoiding the fragmentation of the territory involves the use of deployment standards, ensuring the coverage of complete zones.

CONCLUSION

This *Note d'analyse* examines the potential for additional investment in infrastructure, in France and in Europe, in the wake of the investment plan announced by Jean-Claude Juncker.

If this revival covers investments in the energy, transport, and electronic communication sectors, the amount of additional investment could reach €120 billion per year representing, over three years, an amount greater than the forecasts of the Juncker plan. This maximalist amount mainly corresponds to the implementation of an ambitious energy-climate policy.

Given current budgetary constraints, carefully selecting the desired investments, for which their social utility must be validated, is imperative: socioeconomic evaluation is the appropriate approach, particularly for taking into account the environmental externalities that now justify significant investments in the ecological transition.

Making these investments also assumes properly identifying the current obstacles. In the case of public investment, the budgetary restrictions to which most European countries are subject is the major one. For private investment, beyond the lack of overall demand, there may be a lack of available capital or credit for at-risk investment[23]. Lastly, there are regulatory barriers or obstacles related to the lack of any credible forecast, such as the uncertainty about the price of carbon, which affect investments required as part of the fight against climate change. In the regulated sectors, the ability of the public authorities to credibly commit to the regulatory framework and price conditions is an essential condition for companies to make investments. The proper use of price signals (carbon), standards (building and pollution) and public guarantees would trigger massive investment in various sectors, without necessarily increasing the use of public funding.

Keywords: Investment, energy, transport, digital, socioeconomic evaluation

23. Even though the European Central Bank is currently providing the financial system with great liquidity, the ability of banks to invest in risky projects (the "risk budget") is severely constrained by solvency regulations.

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