FIELD STUDY

Cost-Effective Financing Structures for Mature Projects of Common Interest (PCIs) in Energy

Project number: 2016.7619

Roland Berger GmbH, Boehm-Bezing Mayer & Cie. GmbH
Heiko Ammermann, Henning Diederich, Anke Janousch, Matthias Krebs, Yvonne Ruf
November 2016

More information on the European Union is available on the Internet (http://www.europa.eu).
Luxembourg: Publications Office of the European Union, 2016
ISBN: 978-92-79-63897-8
Catalogue number: MJ-07-16-066-EN-N doi: 10.2833/612097

Executive Summary

Despite existing public support programmes, many PCIs in energy infrastructure are still delayed because of obstacles in financing. Many projects are not reaching the bankability stage. Both investment volumes and project complexity often exceed the capacities of the involved transmission system operators (TSOs).

For this study, four electricity and gas TSOs were selected to receive support in mastering their PCI-related financing challenges. Furthermore, we assessed whether EU instruments, in particular those under the Connecting Europe Facility (CEF) and the European Fund for Strategic Investment (EFSI), are sufficient to ensure the timely realisation of financially challenged PCIs. The results presented in this study provide practical insights for all TSOs with a high volume of PCI-related investment, limited financing capacity or limited experience with public financial instruments.

We found that three kinds of challenges complicate PCI financing:

> **(A) Regular infrastructure financing challenges:** The PCI is commercially viable, but faces the typical risks of regulated energy infrastructure projects: regulatory, project, company financial and country-specific risk.
> **(B) Geographic cost-benefit mismatch:** The PCI has a clear economic value-added overall, but it is not (yet) clear whether the project is commercially viable within the regulatory framework.
> **(C) Managerial/organisational constraints:** The PCI is clearly beyond the TSO's usual project portfolio in scale and/or complexity, and therefore exceeds its managerial and organisational capacity. PCI promoters cannot make sufficient use of the available public funds.

EU instruments are effective at leveraging private investment, but PCI promoters often don't utilise these instruments' full potential. The existing EU financial instruments effectively mitigate regular financing challenges under (A) above. They do this by absorbing some financial risk that the regular market does not absorb, thereby helping to leverage private investment. However, in many cases the financial instruments are not being used due to a lack of know-how on the part of the project promoter. Furthermore, existing EU instruments are not effective in addressing financing challenges arising from a weak commercial case (B) or from organisational capacity constraints (C).

We identified four measures that would support the EU's existing PCI programmes in alleviating financing-related delays and ensure the realisation of energy-infrastructure PCIs. These measures aim to (1) optimise the utilisation of existing financial instruments for PCIs, (2) maximise the efficiency of public funds and (3) build sustainable expertise.

> *Develop equity- and debt-like financial instruments*: In addition to the existing PCI financing measures, we suggest introducing equity and debt instruments with an unbalanced risk-return profile. These instruments offer additional means of financial support between traditional grants and regular, market-oriented financial instruments. Equity- and debt-like instruments would support the realisation of those PCIs that would not reach bankability even if regular instruments were applied. Unlike grants, such instruments allow the EU to participate in potential upsides.
> *Provide financial engineering support*: We suggest advising TSOs on how to achieve bankability by tailoring a financing structure that combines public and private funds in a way that would allow public instruments to cover high-risk portions that are not absorbed by the regular market.
> *Offer capacity building*: We suggest supporting TSOs by building up in-house expertise in financial management and project development to a level that enables the TSOs to successfully implement PCIs (as well as large investment projects in general). Capacity building is an add-on element to financial engineering support with the objective of systematically and sustainably transferring financing know-how to the TSOs.

> *Set up special purpose vehicles as a platform for PCI finance*: We suggest setting up project companies for PCIs in order to integrate additional financial instruments, financial engineering and capacity building into one unified solution.

Table of Contents

Table of Abbreviations

ACER	Agency for the Cooperation of Energy Regulators
bn	Billion
CBA	Cost-benefit analysis
CBCA	Cross-border cost allocation
CEF	Connecting Europe Facility
CF	Cohesion Fund
EC	European Commission
EEPR	European Energy Programme for Recovery
EFSI	European Fund for Strategic Investment
EIB	European Investment Bank
ERDF	European Regional Development Fund
EU	European Union
EUR	Euro
GIPL	Gas Interconnection Poland–Lithuania
INEA	Innovation and Networks Executive Agency
m	Million
PCI	Project of Common Interest
TSO	Transmission system operator

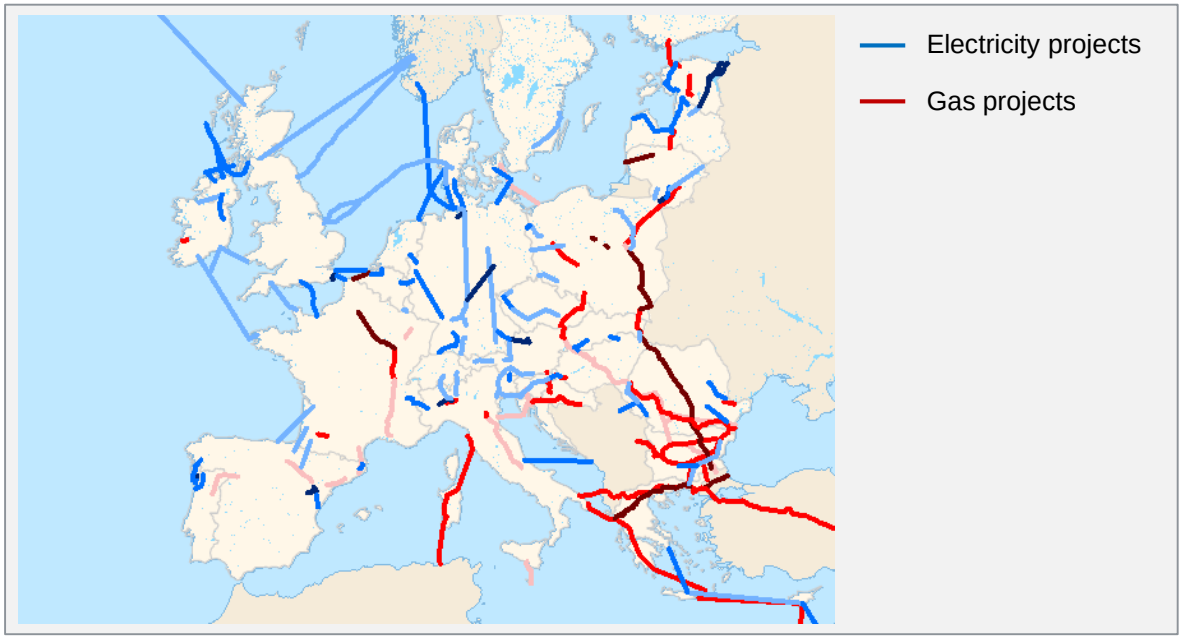
1. Introduction – Financing Challenges Slow Down Mature Projects of Common Interest (PCIs)

Projects of Common Interest are at the centre of Europe's large-scale energy infrastructure upgrade

Up to EUR 200 billion of energy infrastructure investments are required. The European Commission (EC) estimates that these investments are needed over a period of ten years to complete Europe's internal energy market. Upon completion, consumers throughout the European Union will benefit from better integration of the formerly separated electricity and gas systems, from enhanced security of supply and from a higher share of energy from renewable sources.

The EC has published a list currently comprising 195 Projects of Common Interest. This list has been developed in close cooperation with transmission system operators (TSOs), regulators and their respective European associations. This list contains 108 electricity, 77 gas, 7 oil and 3 smart grid projects, representing the most important projects to finalise the integration of Europe's energy market. Each of these projects contributes directly to the development of one or multiple priority corridors or areas, and thereby to the completion of the internal energy market as a whole.

Figure 1 – Overview of electricity and gas PCIs (selection)



Source: European Commission

PCI-related investment volumes often exceed the TSOs' financial capacity. PCIs are almost always large, international projects with high investment volumes and complex stakeholder settings. In many cases, realisation requires more funds and resources than the TSOs can provide internally. Recent waves of unbundling and privatisation add additional complexity, as these new framework conditions require affected TSOs to redefine their financing strategies and secure access to additional sources of finance.

The European Commission has developed support mechanisms and dedicated financial instruments to facilitate the on-time realisation of PCIs

Due to their high strategic importance for the EU, PCIs are eligible for administrative and financial support schemes. Administrative support includes faster permitting procedures and priority treatment by all public institutions involved in the project's development and implementation. Financial support to PCIs has until now mainly been provided under the Connecting Europe Facility (CEF). This support can take the form of grants but also of innovative financial instruments. Additional funds are available under the European Fund for Strategic Investment (EFSI), the Cohesion Fund (CF) and the European Regional Development Fund (ERDF).

In accordance with the general EU strategy, support for PCIs is increasingly shifting to repayable financial instruments rather than grants. From 2014 to 2020, EUR 5.35 billion worth of financial support is available for energy PCIs under the CEF. In contrast to the previous budget, up to EUR 449 million (8.4%) can be used to support PCIs through financial instruments. Compared to grants, financial instruments are designed to use public funds as a lever and catalyst to attract additional private investment and thereby increase the overall volume of funding available for PCIs. On a larger scale, the concept of encouraging private investment through public financing instruments is applied under the EUR 315 billion EFSI, the centrepiece of the Juncker Plan.

Financing constraints still slow down PCIs – this study explores the reasons

With the 2015 PCI progress report, the Agency for the Cooperation of Energy Regulators (ACER) unveiled significant delays in many PCIs due to financing constraints. The report finds that "slightly more than half of the PCIs are behind the original schedule as planned in 2012/2013". Despite extensive efforts undertaken by the European Union, the lack of sufficient project financing remains one reason why PCI implementation is not progressing as planned. According to the report, 24% of all delays in PCIs are mainly caused by financing challenges. Permitting issues continue to cause most PCI delays (58%).

Figure 2 – Main reasons for PCI delays

ACER Agency for the Cooperation of Energy Regulators

Consolidated report on the progress of electricity and gas PCIs (2015 version)

Main reasons for delays as reported by project promoters

Gas PCIs		Electricity PCIs	
# 1	**Financing**	# 1	Permitting
# 2	Permitting	**# 2**	**Financing**
# 3	Technology	# 3	Tendering
# 4	Regulation	# 4	Technology
# 5	Related projects	# 5	Construction

Source: ACER, Roland Berger

The EC commissioned this study to help TSOs overcome their financing challenges and to identify potential gaps in the EU's support schemes. In particular, the study shall (i) support selected TSOs in developing a tailored financing structure for their mature PCIs, (ii) explore whether the existing public financial instruments are effective in attracting private investments in energy PCIs, (iii) identify constraints that prevent TSOs from using available public instruments as levers to attract more private capital and (iv) recommend policy measures to overcome these obstacles.

The remainder of this report is structured in six chapters: Chapter 2 presents the study's focus and the methodology we applied in order to select TSOs suited for technical assistance. Chapter 3 gives an overview of the different types and categories of risks and other financing challenges that complicate PCI funding. Chapter 4 analyses whether and how existing public financial instruments address these challenges, assesses whether existing instruments are used in the most effective manner and highlights those challenges that are not properly addressed by the current portfolio of financial instruments. Chapter 5 introduces complementary support instruments which could help close the gaps in the EU's current instrument portfolio. Chapter 6 provides an outlook and proposes next steps.

2. Focus of this Study: PCIs with Financing Challenges

This study supported four TSOs with particularly complex financing constraints

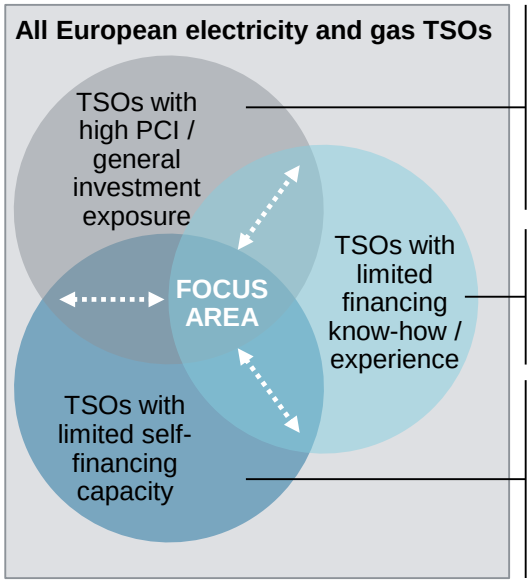
We scanned mature PCIs and TSOs in order to identify those with "out-of-the-norm" financing challenges. First, we considered all 195 PCIs from the 2015 list. From this list we selected 54 mature projects with multiple promoters. Second, we analysed the 58 TSOs which have at least one mature, international PCI in their portfolio and short-listed those TSOs that do not have an investment credit rating and are located in a country with an upper-medium or lower debt rating. This short list consisted of 17 TSOs that we prioritised for participation based on their likelihood of facing constraints in PCI financing.

We found that three indicators point to a high likelihood of financing constraints:

1. **High PCI and/or general investment exposure:** The first and in many cases decisive indicator is the size of the TSO's investment pipeline. High future-to-historic investment ratios and investment-to-asset ratios are good indicators of increasing stress on the TSO's balance sheet. For both ratios, non-PCI projects were included in the calculation of total investment volume. Besides these relative indicators, the absolute number of projects was considered as well.
2. **Limited self-financing capacity:** The second indicator is the TSO's ability to finance its investment pipeline with internally generated cash flows, as well as the unused debt capacity of its balance sheet. The main measures of the TSO's self-financing capacity are the ratio of debt to assets and the ratio of future investments to cash flow generated by operations. In addition, the currency in which revenues are denominated has been taken into account. Revenue denomination has a strong impact on the availability and terms of credit and other forms of external funding.
3. **Limited financing know-how and experience:** The third indicator is the availability of sufficient in-house financing know-how and experience. We considered TSOs who don't have prior (or only little) experience with public financing sources The same logic applies to experience with private investors, especially non-bank and foreign investors, as well as experience in accessing the capital market.

Accordingly, the indicators and ratios presented in Figure 3 signal particular financing challenges. To be selected for this study, TSOs and their PCIs scored high on at least one of the three main indicators. In addition to these purely factual selection criteria, the TSO's motivation to participate in the field study and work closely with a team of external experts was considered as well.

Figure 3 – Selection criteria for TSO sample (field study)



PCI / general investment exposure	
> Number of active PCIs	≥ 3
> Number of mature PCIs	≥ 2
> PCI investment volume	≥ EUR 200 m
> Future investment volume / Total assets	≥ 0.5
> Future / historic investment volume	≥ 1.75
Self-financing capacity	
> Debt / Total assets	≥ 0.5
> Future investments / funds from operation	≥ 1
> Denomination of revenue (currency)	≠ EUR
Financing know-how / experience	
> Experience with CEF, EEPR, other PCI support programmes	no / little exp.
> Experience with public investors	no / little exp.
> Experience with private investors	no / little exp.
> Capital market exposure	no / little exp.

Four selected TSOs received support in tailoring specific financing models. Over a period of five months, the four TSOs selected for this study joined forces with external experts to define the most effective financing structures for their respective PCIs and discuss measures to improve EU financial instruments. All types of public and private financing instruments were considered. TSOs received advice on suitable financing instruments and structures that fit their respective investment portfolio as well as their regulatory, legal and commercial framework conditions. This technical assistance also considered non-PCI investment projects and the TSOs' general (re-)financing needs. Recommendations were verified with potential public and private investors as well as other non-study TSOs with a very high degree of financial experience. It was agreed with all four participants that their identity and the specific results of the technical assistance programme would remain confidential.

This study offers valuable insights for all TSOs with sizeable PCI investments

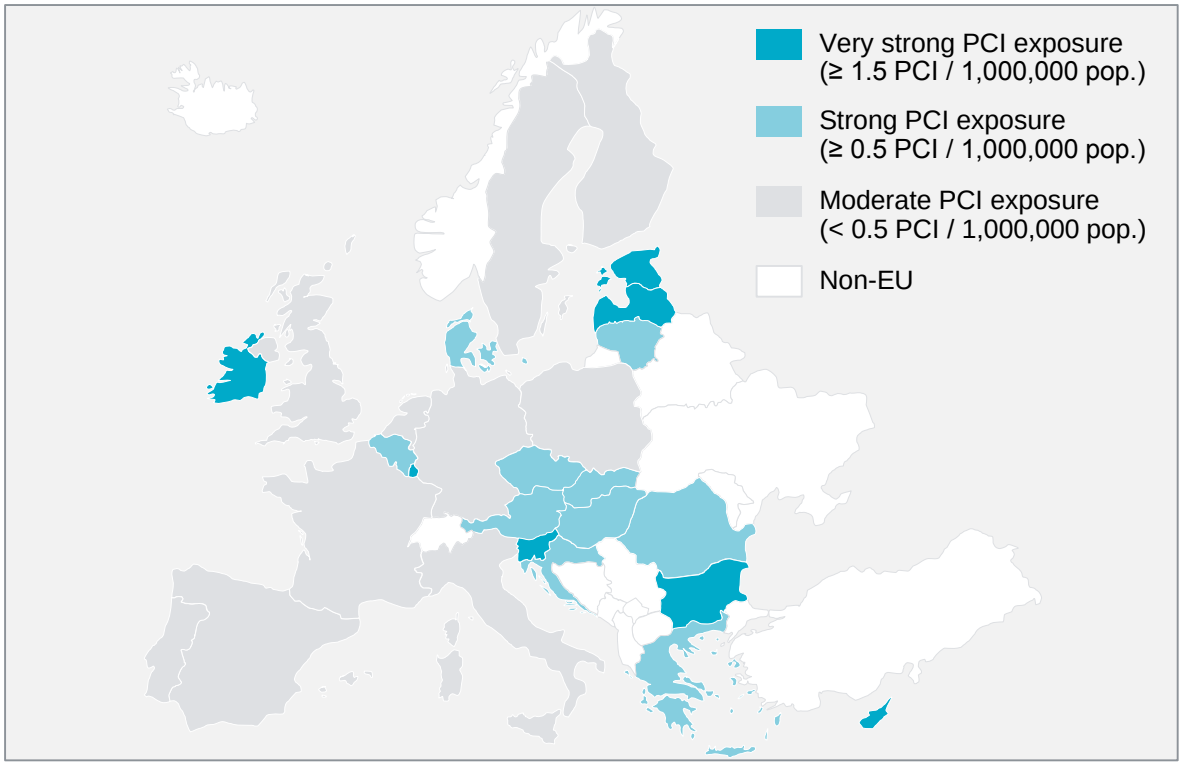
This study offers valuable insights for all PCI promoters who can identify with any of the three broad selection categories: high PCI exposure, limited self-financing capacity (compared to the required financing volume), as well as limited in-house financing know-how and experience, especially with public financial instruments. The criteria presented in Figure 3 above allow PCI promoters to self-assess whether they are likely to face similar challenges in PCI financing as the four participants in our study.

Project promoters can use these insights to identify improvement potential for financing generally. Many of the analyses, overviews and recommendations in this report hold true for a broad variety of projects, even under different framework conditions. However, as each PCI/TSO is unique, the tailoring of specific financing structures (financial engineering) will still need to be done on a case-by-case basis.

PCI concentration tends to be highest in small, peripheral EU member states (see Figure 4). Countries on the European periphery are characterised by comparably small, historically less integrated, and highly regulated energy markets. Due to the concentration of PCIs (particularly large

PCIs) in these countries, the respective TSOs often face very challenging financing tasks. This translates into a particularly high need for financial and technical support from the European Union.

Figure 4 – PCI intensity – Number of PCIs (electricity and gas) per 1,000,000 inhabitants



Source: Regulation (EU) No. 347/2013, Roland Berger

3. Challenges – Risks and Challenges Hampering PCI Financing

We identified three categories of challenges that complicate PCI financing

Category A – Regular infrastructure financing challenges: The PCI faces the typical risks of regulated energy infrastructure projects. The PCI is commercially viable within the regulatory framework and bankable, as these risks can be addressed with existing financial instruments.

Category B – Geographic cost-benefit mismatch: A cost-benefit assessment shows that the PCI brings an economic value-added overall, but it is not (yet) clear whether the project is commercially viable within the regulatory framework. Available financial instruments do not fully address this challenge.

Category C – Managerial/organisational constraints: The PCI is clearly out of the norm compared to the TSO's regular project portfolio and exceeds its managerial/organisational capacity.

Depending on the situation, individual challenges from each of these three categories might to considerably raise the risk premium required by private (and public) investors or even discourage investment at all. This is especially the case for challenges in Categories B and C – which basically prevent projects from becoming bankable.

Category A challenges – the PCI is commercially viable within the regulatory framework but faces the typical challenges of energy infrastructure projects

Four classes of risk factors determine the overall risk level of energy infrastructure projects: regulatory risk, project risk, company financial risk and country risk. The manifestation of these individual risks determines the quality of the investment opportunity – in other words, its credit rating. The credit rating defines whether a project is financeable and under which terms and conditions financing is available. In small and/or less mature capital markets, a weak credit rating might also result in insufficient capital availability, as too few investors are willing to take on such high risk even if an appropriate, risk-adjusted remuneration is offered. Below, the four risk classes and the underlying risk factors are presented in more detail. Figure 5 provides an overview.

Figure 5 – Typical classes and indicators of risks found in infrastructure projects

Regulatory risk	Project risk	Company financial risk	Country risk
Common indicators:	**Common indicators:**	**Common indicators:**	**Common indicators:**
> Degree of unbundling and unbundling approach > Coverage of capital costs > Compensation for revenue and cost fluctuations > Experience of regulator and stability of regulatory regime	> Maturity of technology > Green vs. brown field project > TSO's track record in project management (on time / budget) > Interdependencies with other projects	> Financial structure: Maturity matches, interest stability, covenants, etc. > Shareholder structure: Presence of anchor / strategic investors > Financial ratios: e.g. debt ratio, debt-coverage ratio > Financing know-how	> Country ratings of major international agencies (sovereign ratings, country ceilings, transfer and convertibility assessment)

Regulatory risk: Regulatory framework conditions have direct implications for the structure and the business model of the TSO and therefore determine its financial resources. Low and uncertain regulatory cash flows obstruct or, in drastic cases, even prevent access to financing. Investors evaluate regulatory risks as follows:

> *Degree of unbundling and unbundling approach*: Infrastructure investors tend to prefer full unbundling and a strict separation of regulated and non-regulated activities. Non-regulated activities with a considerable effect on financial position and performance increase the risk as perceived by traditional infrastructure investors. In addition, investors prefer concentrated ownership of all transmission assets in a country or market area with one TSO. Lease models are attractive to investors as well. Lastly, the incomplete implementation of European or national law (e.g. the EU's Third Energy Package) by the regulator is seen as a major source of uncertainty and therefore financial risk.

> *Coverage of capital cost:* Due to the very high costs associated with many PCIs, timely and complete consideration of new investments as part of the regulated asset base is important because it allows the TSO to generate regulated income from these assets. Once an investment is part of the regulated asset base, transparency on the mechanism that determines the regulatory interest rate is essential for the investors' assessment. Where applicable, absolute caps on the capital costs acceptable under the regulation scheme are usually a major concern of investors.

- *Compensation for fluctuation of revenues and costs:* As revenues and costs are subject to uncertainty, ex post adjustments might be required to neutralise unforeseen excess or deficit returns. Suitable measures include carry-forwards and carry-backs or mechanisms to redistribute revenues and costs, in particular for cross-border transactions. Any situation that could negatively affect the profitability of the TSO is seen as an additional risk.
- *Experience of regulator and stability of regulatory system:* As PCIs are mostly very long-term assets, investors do not limit their assessment to the current regulatory regime. The predictability of the tariff regime is of utmost importance. Hence, the historic development of the regulatory regime, the regulator's political independence and its perceived level of professional know-how are decisive criteria in the assessment of regulatory risk.

Project risk: Infrastructure investors usually provide funding for a specific purpose, such as the realisation of a specific PCI. As their financial models and risk assessments are based on an envisioned schedule and a specific budget, they conduct a detailed review of risk factors that could potentially lead to delays or cost overruns.

- *Maturity of technology:* The more innovative the technological solutions, the higher the risk that the project will incur cost increases or delays caused by unforeseen problems. Hence, investors will include a risk premium if new technologies play an important role in the project.
- *Green vs. brown field:* Building new infrastructure is almost always more challenging and risky than retrofits, modernisations or enhancements of existing assets. Environmental and social impact assessments and lengthy permitting procedures have in the past led to quite substantial delays. Even though PCIs benefit from fast-track permitting procedures and political support, green field projects continue to carry higher risks than replacement or expansion projects.
- *TSO track record:* Another important consideration is the TSO's track record in the development and implementation of investment projects. If the TSO has demonstrated that it has the skills and resources required to complete comparable projects on time, on budget and at the expected quality, this certainly has a positive impact on investors' assessment of project risk.
- *Interdependencies with other projects:* Per definition, PCIs work in combination with other projects in the same corridor or in the same area. In most cases, PCIs only reach their full commercial potential once all sub-projects have been completed and the corridor or area is fully operational.

Company financial risk: The TSO's general creditworthiness is a very important risk driver in all cases where the PCI is financed through the TSO's balance sheet (corporate finance approach). In this regard, investors are particularly interested in the strength of the TSO's existing balance sheet and the long-term stability of the TSO's financial and organisational structure. Out of all the criteria that contribute to the overall company credit rating (also considered by independent rating agencies), the following four aspects usually rank among the most important:

- *Financial structure:* An important consideration is the long-term stability of the TSO's financing structure in terms of composition and financing costs. Investors will carefully assess if the maturity of debt instruments corresponds to the commercial lifetime of the asset base and to what extent changes in interest rates caused by the refinancing of maturing debt affect the TSO's profitability. In addition, investors will assess whether the financing of PCIs or other upcoming projects might risk the breach of covenants and therefore trigger structural changes or cost increases.
- *Shareholder structure*: Besides the overall composition of the financial structure, investors also show great interest in the composition of the shareholder structure. Here, the presence of long-term-oriented strategic or anchor investors decrease company financial risk. Particularly beneficial for investors' risk assessment is (partial) state ownership due to the prospect of state aid in the event of financial distress.

- *Key financial ratios*: Ratios and financial metrics traditionally also play an important role in the evaluation of credit risks. For instance, debt-coverage ratios below 2 and debt ratios above 50% are usually only feasible if the underlying business model has a very low inherent risk. Otherwise, the required premium on the country's sovereign interest rate increases considerably.
- *Financing know*-how: The strength of a TSO's financing know-how is also seen as an important risk factor by long-term-oriented investors. Professional and therefore dependable financial strategies are viewed very positively.

Country risk: As an integral part of the national infrastructure, the profitability of transmission systems is closely related to the country's economic and political development. While political risks in EU member states are mostly low to negligible for investors, economic risk can be substantial. Croatia, Cyprus, Greece and Portugal are rated non-investment grade, and some other EU countries have ratings only slightly above the investment-grade threshold. As the ratings of TSOs and their respective countries tend to be highly correlated, the financing costs of TSOs from medium and high risk countries are usually subject to a risk premium. Another factor contributing to the country risk is the development of the national capital market. A strong capital market increases the likelihood that the TSO can refinance its maturing debt at competitive rates and raise capital for additional investments. Lastly, international investors might charge higher rates in the presence of an exchange rate risk (non-euro denominated revenues).

The relevance of the four above-mentioned risk classes depends on the financing approach. Under a corporate finance approach, the specific risks from each of the four categories jointly contribute to the overall creditworthiness of the TSO and therefore its ability to secure financing at reasonable cost. The risk profile of the PCI itself is only relevant in so far as it impacts TSO-level parameters. If a project finance approach is used, the list of relevant risk classes is reduced to three: regulatory risks, project risks and country risks. As project financing leads to a separation of the PCI from other business activities of the TSO, overall company financial risk is only a minor concern – if it is considered at all. While such legal separation of PCI and TSO might have its benefits, this approach is only feasible if the PCI can be isolated from the overall regulated asset base of the TSO and has a stand-alone business model. This is the case for e.g. submarine cables or grids, or purely transit-oriented gas pipelines. If admissible according to the country's regulations, lease structures might be another approach to enable project financing, even for commercially non-separable assets, i.e. parts of the regulatory asset base (see Chapter 5.4 for the benefits of project finance structures/project companies).

Category B challenges – the PCI has a proven economic value-added but its commercial viability within the regulatory framework is not (yet) clear

To be classified as PCIs, projects need to demonstrate a substantial cross-border impact. Classification as a PCI requires that projects (i) lie in one the EU's priority corridors and areas, (ii) demonstrate that their costs exceed their benefits and (iii) are located in or have a positive impact on at least two member states (or a member state and a European Economic Area country). In addition, PCIs need to demonstrate a significant positive impact on any of the following: market integration, sustainability, security of supply or competition (see Regulation (EU) No 347/2013).

A positive cost-benefit assessment is the essential criterion from a macroeconomic stance. In order to receive PCI status, a project's overall benefits must demonstrably exceed its total costs. In this context, benefits mean all economic, environmental and societal benefits regardless of the member state in which they occur. Hence, a positive European cost-benefit analysis (CBA) does not necessarily mean that (a) a PCI is commercially viable, because positive externalities (e.g. avoided pollution) are taken into consideration as well, or (b) that a country-by-country assessment would result in net macroeconomic benefits for each and every country involved.

Geographic cost-benefit mismatches complicate realisation. If the positive effects associated with a particular PCI (i.e. security of supply, integration of renewables, market integration or increased competition) occur in a different country than the costs, then the PCI is often not commercially viable based on a purely domestic business case. In such situations, regulators are usually reluctant to acknowledge the PCI as part of the national TSO's regulated asset base in order to prevent national system users from effectively subsidising consumers in other EU countries. If the regulator does not allow the PCI to become a part of the regulated asset base, the TSO would need other, non-regulated income to finance the project. Alternatives to the regulated transmission tariffs include congestion charges (for electricity projects) and firm capacity bookings (for gas). The implementation of such non-regulated business models would, however, be at the TSO's own risk. Regulators would almost certainly assess such risk as too high for domestic customers to absorb.

Cross-border cost allocation (CBCA) mechanisms do not have the desired effect in resolving the deadlock caused by the unbalanced distribution of costs and benefits between the stakeholder countries of a particular PCI. The idea of CBCAs is to reach a positive investment decision through a cost sharing agreement between the PCI partners. Under this agreement, the country with the negative net benefit, i.e. a high cost and low benefit share, would receive compensation from the country with (strongly) positive net benefit in order to arrive at a fair overall allocation of costs and benefits across all stakeholders of the project. A recent example is the EUR 85.8 m CBCA decision on the GIPL project affecting Poland and the Baltics. While the approach in theory leads to welfare increases on both sides of the border, it is not yet well established in practice. All too often, TSOs and national regulators engage in cumbersome arms-length negotiations or expect the European Commission to resolve the conflict by neutralising any negative net benefit through grants for works as foreseen as a last resort in the regulation on the Connecting Europe Facility (Regulation (EU) 347/2013). In addition, project promoters may also prefer to reach agreement outside this formal arbitration approach in order not to damage their relationships. As a consequence, more projects than necessary remain non-bankable and require public assistance.

Category C challenges – TSOs face managerial and organisational constraints due to PCIs' out-of-the-norm size and complexity

The sheer size of many PCIs puts considerable stress on the TSOs' organisations. As illustrated in Figure 4 above, a disproportionately large number of PCIs are located in small, peripheral EU member states. Investment volumes per PCI do not systematically decrease in relation to market size. Consequently, the volume of these TSOs' PCI pipelines is often very substantial compared to their financial and organisational capacity. Table 1 illustrates the out-of-the-norm character of PCIs for the 17 TSOs in our sample (see selection criteria outlined in Chapter 2). We have used the following indicators to measure managerial/organizational stress from large-scale PCI development:

> *Ratio of PCI investments to regular annual investments:* The investment volume, based on still-active PCIs from the 2015 list, is on average more than six times higher than average annual non-PCI investment over the last five years. In one case, PCI investment exceeds average non-PCI investment by a factor of more than 250. However, this very high ratio is largely due to particularly low investments in the reference period.

> *Ratio of PCI investments to total assets:* Taken together, the volume of all PCIs not yet implemented on the 2015 list represents 38% of the sampled TSOs' total assets. In some cases, PCI investments alone will lead to a doubling of the (regulated) asset base within the usual planning horizon of ten years.

Table 1 – Relative size of PCI investments versus TSOs' regular investments and total assets

	Total (over sample of 17 TSOs)	Minimum TSO value (in sample)	Median TSO value (in sample)	Maximum TSO value (in sample)
Number of mature PCIs	64	1	4	6
Investment volume of mature PCIs [EUR m]	**7,030**	26	245	1,374
Regular investment (rolling 5-year average) [EUR m]	1,170	0.5	63	228
Total assets (last fiscal year) [EUR m]	18,566	77	1,018	3,038
PCI investments/ regular annual investments	**6.06x**	0.27x	4.41x	250.73x
PCI investments/ total assets	**0.38x**	0.02x	0.34x	1.67x

Source: Bloomberg, European Commission, TSO annual reports, Roland Berger

Besides size, complexity is a second aspect that makes many PCIs out-of-the-norm projects. In contrast to national infrastructure development projects, PCIs usually have multiple promoters. Interdependencies with other domestic and regional projects (often other PCIs) complicate project development and financing even further. TSOs need to coordinate their activities with multiple partners and other stakeholders. Furthermore, the investment volume associated with PCIs often requires TSOs to rethink their financing strategies and open up new financing sources besides internally generated funds and capital provided by their shareholders. In some cases, the financing of a given PCI is the first time that a TSO needs to enter into negotiations with outside investors.

Many TSOs struggle to meet the demanding requirements of domestic and in particular international investors. Especially those TSOs with limited experience post-unbundling and post-deregulation lack the know-how to properly de-risk their business models and package acceptable financing options. Large, international investors, however, require readily prepared and well-structured proposals before they can start with the preparation of their investment and credit decisions. Preparing project documents that meet their high standards is a challenge in itself, but absolutely essential to getting this group of investors on board.

Limited experience in pre-structuring financing solutions and dealing with large institutional investors prevents the financing of ultimately bankable PCIs. Large institutions, especially, might reject investment proposals just because their minimum formal requirements are not met. They are used to reviewing state-of-the-art documentation that allows them to conduct a first assessment without detailed prior knowledge of the political, economic and regulatory situation in the country under consideration. While some requirements such as translating all project-related documentation into English are easily fulfilled, others such as the pre-selection of suitable financing options and partner investors require advanced know-how in infrastructure financing.

4. Levers – Instruments to Optimise PCI Financing

Existing instruments mitigate regular risks in PCI financing, but don't increase commercial viability or alleviate organisational constraints

Standard financial instruments alone cannot transform all PCIs into attractive investments. Regulation and the nature of financial instruments set a clear limit to what existing financial instruments can achieve. They reliably improve the financing conditions of mature, bankable PCIs.

However, the same instruments lose their effectiveness whenever commercial viability and therefore bankability is not yet clear, e.g. when PCIs are dominated by common European rather than domestic benefits or in cases where organisational constraints delay the realisation of PCIs. The following section discusses the EU's existing instruments as well as others, and outlines how they address the regular financing risks described above.

The EU offers grants and financial instruments to support PCIs

Grants are the conventional approach to support eligible projects financially. These non-repayable funds originate directly from the central budget of the European Union and are disbursed to the final beneficiaries through intermediaries. These intermediaries could either be national managing authorities (the most common case) or European agencies acting on behalf of the European Commission. In the case of the CEF, for instance, the Innovation and Networks Executive Agency (INEA) is operationally responsible for the administration of grants. Grants are very often used to co-finance preparatory studies and thereby reduce the TSO's loss if a project turns out to be economically or technically non-viable. If the TSO can demonstrate that a PCI is economically desirable but not commercially viable, and if CBCA decisions are insufficient in volume, then the TSO can also apply for additional work grants. Grants for works can cover up to 50%, and in exceptional cases up to 75%, of total PCI-related investment costs. While grants are effective in promoting project realisation, they are also the least efficient form of public financial support and should therefore only be used as a last resort.

Box 1 – European Union funds available to promoters of PCIs in energy

The **Connecting Europe Facility (CEF)** is the EU's main programme to finance Projects of Common Interest. Out of the overall 2014-2020 CEF budget of EUR 30.44 bn, EUR 5.35 bn is allocated to the energy sector. The remaining EUR 25.09 bn is shared between transportation (EUR 24.05 bn) and telecom PCIs (EUR 1.04 bn). Under the CEF, PCIs in energy can receive financial assistance as grants for studies and works, or in the form of financial instruments (up to 8.4% of the CEF budget). While the grants are administered by INEA, financial instruments are developed and disbursed by the European Investment Bank. Typical financing instruments set up under the CEF include credit enhancement for project bonds and funded senior loans, the most common instrument in infrastructure financing. CEF-backed financial instruments have the advantage of allowing the EIB to take higher risks than they could under their regular lending operations. To date, 64 grant agreements with an overall volume of EUR 733 m have been signed. Financial instruments have not been used so far. However, additional instruments are under development with the EIB and will be offered to the market soon.

The **European Fund for Strategic Investment (EFSI)** was set up in 2014 to increase private investment activity in the European Union. The basic idea of the EFSI is to use public funds as a catalyst to encourage private investors to engage in projects that would otherwise not receive funding. The EFSI offers funding in the form of financing instruments only. Unlike the CEF, the EFSI's activities are not limited to PCIs. Nevertheless, PCIs are welcome to apply for EFSI financing.

Additional funding is available under the **European Structural and Investment Funds (ESIFs)**: The **European Regional Development Fund (ERDF)** supports, among others, projects that facilitate the shift towards a low-carbon economy. Similarly, the **Cohesion Fund (CF)** supports environmental projects in member states whose per capita income is below 90% of the EU average. Both programmes offer financial instruments as well as grants. Support is not limited to PCIs.

Under the 2014-2020 framework, the EU is strongly promoting the use of financial instruments. The most prominent example for the shift towards financial instruments is the EUR 315 bn European Fund for Strategic Investment (EFSI), which is part of the so-called Juncker Plan. The two most important arguments that lead the EU to prefer financial instruments over grants are that they are (i) repayable and can therefore be used again for later projects and (ii) designed to attract co-investment from private sources, which leads to an increased economic impact per euro of public funds spent. Whereas previous multiannual financial frameworks did not allow for public financial instruments in energy infrastructure projects, the 2014-2020 framework opened up completely new opportunities to support PCIs and is strongly promoting the use of financial instruments in this area.

Public and private institutions offer a large variety of financial instruments

Six instrument types exist for PCI financing. The following overview introduces these different instrument types, briefly describes their basic principles and indicates whether they are primarily used in the public and/or the private sector.

- **Equity:** Equity investments are the direct or indirect provision of capital to a firm in return for total or partial ownership. Equity investors may also have some management control of the firm. Investments in equity carry the highest risk but also offer the highest return of all general instrument types introduced in this section. In case of bankruptcy, equity holders only receive the residual amount of capital that is left over after all external creditors have been served. For taking this risk, investors are remunerated through dividends and capital gains. Equity investments are usually made for open-ended time spans. Equity is usually provided by private investors. Public sector offerings are rather rare.
- **(Senior) loans:** Loans are agreements that oblige a lender to make available to a borrower an agreed sum of money for a certain period of time. In return, the borrower is obliged to repay that amount within the agreed time and in most cases also to compensate the lender through fixed or variable interest payments. Investors prefer senior loans backed by collateral. However, this is often not feasible in infrastructure financing due to factual and regulatory restrictions. Senior loans are standard offerings of both private and public financial institutions.
- **Junior loans (also called quasi-equity or mezzanine capital):** In principle, the junior loan is identical to the senior version. The distinctive feature is that junior loans are subordinated – they rank between equity and regular (senior) debt and are therefore treated as equity by more senior creditors. Consequently, junior loans carry a higher default risk than their senior equivalents and are therefore usually eligible to receive a higher interest premium. Unlike senior loans, they are mostly unsecured, i.e. not backed by collateral such as a transmission asset. Junior loans are a standard offering of public financial institutions. Some private investors specialise in subordinated loans as well.
- **Bonds:** A bond is the securitised version of a loan. Securitisation allows bond holders to easily sell their bonds to other investors on the secondary market. Therefore bonds are more liquid than conventional loans. By issuing bonds, (large) borrowers get access to international credit markets, which are in many cases deeper than their domestic counterparts. Bonds are typically held by private investors. Companies issuing bonds are usually supported by commercial banks who prepare all necessary documentation for the bond issuance. In some cases, public institutions might be involved in this process as well.
- **Credit facilities:** Credit facilities (e.g. construction facilities) are umbrella loans or credit lines that companies can draw on at their own discretion (e.g. if they need additional cash to pay contractors during the construction phase). Credit facilities are more common with private banks.

However, due to the Basel III regulations, credit facilities have become quite costly products in the eyes of private institutions and are offered less frequently than in the past.

> **Guarantees:** From an issuer's perspective, guarantees are contingent liabilities. They are written commitments to assume responsibility for all or part of a third party's debt if an event occurs which triggers such guarantee, such as a loan default or a shortfall in revenues. Guarantees are a primary instrument of public institutions and governments (incl. the EC).

In the current low-interest-rate environment, public and private instruments are becoming increasingly similar

Traditionally, favourable interest rates were the distinguishing feature of public instruments. In times of historically low interest rates, however, this benefit has mostly vanished. Lending conditions of public and private institutions have become increasingly similar in terms of cost. Because the interest rate differences between EU member states are declining as well, interest rate discounts have lost most of their previous appeal – even among borrowers from countries with medium range credit ratings.

Public instruments are perceived as more complicated to deal with. The comparably higher administrative burden that comes with applying for public financial assistance is one of the reasons why some companies prefer working with private investors, particularly if the cost advantage of public instruments is rather low. Another drawback of public institutions is that the terms and conditions of their offerings are difficult to navigate, especially for companies not working with public instruments on a regular basis. Support programmes are fragmented and administered by different institutions (see Box 1 above), eligibility criteria are often complicated and the assessment of individual eligibility consumes time and resources. Moreover, application and fund utilisation deadlines, as well as documentation requirements regarding the use of funds, are generally more complex than they are in the private sector.

The biggest value-added of public instruments is their ability to absorb risk. Unlike their private-sector counterparts, the mission of public financial institutions such as the European Investment Bank (EIB) is to implement European policy, in this case energy policy. The financial backing of all EU member states and the absence of binding return requirements allow the EIB to take higher financial risk than private banks if this is necessary to contribute to the implementation of European policy. Ideally, this allocation of risk to the public allows private investors to contribute funding to the respective (de-risked) investment project as well. The EIB's Project Bond Credit Enhancement product illustrates how risk absorption works in practice (see Box 2 below).

Box 2 – Innovative public instruments: the EIB's Project Bond Credit Enhancement

Before the 2007-2008 financial crisis, bond issuers such as TSOs used the services of specialised insurance companies (so-called wraps) to boost the credit rating of their bonds. Most bond insurers filed for bankruptcy in the aftermath of the financial crisis and the market for credit insurance dried up. As a consequence, it became considerably more difficult for non-investment-grade-rated TSOs to find sufficient interest for their bonds, in particular for bonds of long duration.

The EIB's Project Bond Credit Enhancement (PBCE) product helps project promoters to improve the credit rating of their bond issues and gain access to a wider range of institutional investors, including pension funds and insurance companies. The PBCE instrument is offered as a funded and an unfunded product. The funded PBCE comes in the form of an irrevocable, unconditional revolving letter of credit, while the funded PBCE resembles a funded mezzanine tranche. In both cases, PBCE support is available for up to 20% of the outstanding principal amount of the senior debt. The offering found great appeal among investors during its pilot phase in 2012.

While standard financial instruments are generally effective, they cannot resolve organisational constraints, nor do they overcome viability gaps

EU financial instruments address regular risk categories found in infrastructure financing. The following examples illustrate how the four main risk categories found in PCI financing are currently addressed by existing financial instruments offered under the Connecting Europe Facility:

> **Company financial risk mitigation:** Credit enhancement products for bonds (see Box 2) and loans effectively reduce the credit risk for private investors. This effect is achieved through the introduction of subordinated credit tranches or corresponding guarantees that limit the losses of more senior tranches in case of default. Under the current regime, the size of these first-loss pieces is limited to 20% of the outstanding principal amount of the senior debt.

> **Project risk mitigation:** The EIB's new hybrid product provides equity-type debt financing of which 50% is recognised as equity and 50% as debt by the leading rating agencies. Partial equity recognition allows TSOs to expand their balance sheets during the construction period without risking the breach of existing debt covenants. Once construction is completed and the projects become part of the revenue-generating regulatory asset base, the equity instrument is replaced by conventional financing products. Hybrid instruments target investment-grade-rated TSOs only.

Regulatory risk mitigation: EU financial institutions currently do not offer specific instruments targeting regulatory risk. This category is covered indirectly by credit enhancement products.

Country risk mitigation: EU financial institutions currently do not offer specific instruments targeting country risk. This category is covered indirectly by credit enhancement products.

Experience from the field study shows that external support helps TSOs to get the most out the existing EU financial instruments

Financial engineering support closes the know-how gap and thereby directly addresses the main reason for the suboptimal utilisation of financial instruments in PCI financing.

Long-term stability and reasonable costs are key objectives of financial engineering. Energy infrastructure projects often need decades until initial investments are paid back. Against this background, financial engineers need to strike the right balance between low financing costs and long-term stability. Here it is important to correctly assess a TSO's individual risk-bearing capacity and carefully consider overall financial strategy and objectives, financial flexibility, and protection against adverse economic development and business risks. Lastly, financial engineers need to consider the availability of funds and the maturity of the domestic capital market.

Financial engineering support has been provided throughout the study and has been at the core of the technical assistance. While the individual solutions developed for the four reference TSOs are confidential and also could not be easily transferred to other cases due to the inherently high degree of customisation, the following examples illustrate the tools of financial engineers and thereby indicate how financial engineering works in practice:

> **Construction facilities:** Dedicated credit facilities work as an additional cash cushion in the construction phase. By using credit facilities instead of loans, TSOs can protect themselves from additional financing costs caused by delays in permitting and/or construction.

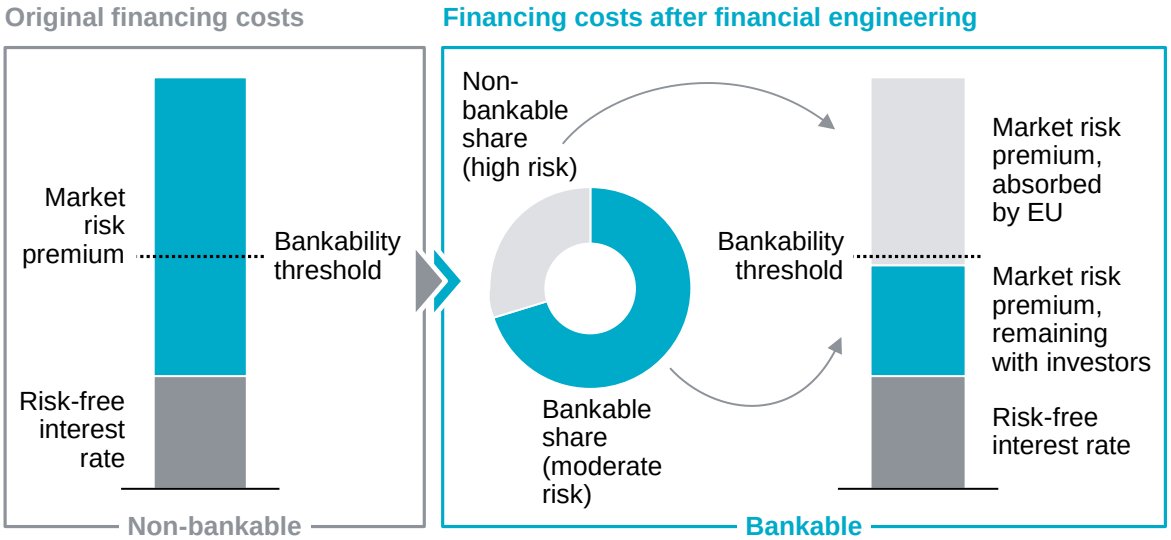
> **Equity support:** Integrating junior (or hybrid) loans into the financing mix optimises interest payments by carefully matching investors' risk appetite with project risks. While junior loans are costly, they are partly accounted for as equity and hence reduce the financing costs for the senior tranche of the debt. As such, equity support pays off if the avoided interest expenses on senior (regular) debt exceed the additional cost associated with the junior loan.

- **Regulation enhancement:** For large investment projects, regulation periods are almost always shorter than payback periods. Hence, adverse regulatory change can put the TSO's ability to repay its debt at risk. This might lead to higher interest rate requirements or, in the most extreme case, to the loss of a bankable business model. Regulation enhancement features incorporated into the financing solution mitigate the effect of adverse regulatory changes on profitability and therefore create reliable framework conditions for investors. A typical example of regulation enhancement is hedging the regulatory interest rate.
- **Volume enhancement:** Another typical risk of energy infrastructure projects is uncertainty with respect to volume, i.e. utilisation rates. Similar to regulatory changes, low utilisation rates lead to revenue shortfalls and thus might risk the financial stability of the asset operator. Volume enhancement offers a solution for this type of problem. In practice, volume risks are mitigated through public volume guarantees or by an automatic prolongation of the repayment scheme once volumes fall below a certain limit.

These examples are illustrative and cannot be generalised. Individually engineered financing structures will always include multiple elements and are clearly not limited to our four examples.

Financial engineering reduces financing costs and facilitated PCI implementation. Effectively, the risk absorbed by the public sector through public financial instruments allows PCI promoters to either secure financing commitments from very long-term-oriented infrastructure investors (such as pension funds or insurance companies) or to finance their project directly via the capital markets. Both options result in substantial reductions in financing costs compared to alternative sources of financing (such as bank loans and even conventional soft loans). In addition, the proposed partial risk transfer to the public sector opens up the project for more private investment. Ultimately, the risk absorbed by the public sector makes the project bankable in the first place, reduces financing costs and brings down total project costs. On average, the financing structures proposed in this study reduced financing costs by a euro amount in the double-digit millions. Thus, financial engineering contributes to positive CBA assessments and increases the likelihood of national regulation authorities approving the financing cost proposal. Once approved, PCI financing costs can be covered by the country's regulatory regime. If the energy market under consideration works efficiently, then all savings in financing costs at PCI level are profit-neutral for the TSO and any other company in the value chain, and would thereby be passed on to the final consumers.

Figure 6 – Financing cost reduction through financial engineering



New approaches are required to optimise PCI financing and close the gaps in the current portfolio of PCI support

Financial instruments cannot address the challenges of PCIs that are not commercially viable within the regulatory framework. While public financing instruments allow TSOs to reduce the financing cost of their bankable PCIs, they cannot be used to overcome those financing gaps that arise from a lack of commercial viability. Although the EIB can take higher risks under CEF than under its normal operations, excessive risk taking is not permitted. All financial instruments are subject to the fundamental rules of banking and need to provide a specific minimum return, which is not fulfilled if the business case fails to reach commercial viability within the regulatory framework. In these cases, public instruments help to narrow the gap – but they definitely cannot close it entirely.

The lack of in-house financing know-how limits the effectiveness of existing EU instruments. Among the TSOs participating in the field study, only a minority are in regular contact with the EIB and other European institutions to collect information on the latest products and explore the potential for cooperating on upcoming projects. While most of the other TSOs are aware of the general range of public support instruments, opportunities to actually use these instruments are not being evaluated systematically. Public instruments are only used, if at all, when recommended or required by the private banks involved in financing the TSO. The suboptimal utilisation of public instruments, however, is not the only indicator that unveils deficits in TSOs' PCI financing approaches. As a consequence of the recent unbundling, the financing sources used by most TSOs are still limited to internally generated funds, group financing and senior corporate loans. Another shortcoming is that none of the TSOs except one tailored its financing strategy towards specific PCIs. Instead, they used comprehensive corporate financing approaches. Irrespective of the benefits of project-level financing, a customised approach remains a rare exception.

Novel solutions are required to ensure the realisation of PCIs that are not yet bankable. Some of the challenges identified throughout this study cannot be properly addressed and mitigated by the existing financial instruments. This applies to all cases where the commercial viability under the regulatory framework is compromised (see Category B above), or where the resource and expertise requirements of big and complex projects exceed the promoter's capacity (see Category C above).

Figure 7 – Coverage of PCI financing challenges by EU financing instruments

	A Regular infrastructure financing challenges				B Geographic cost benefits mismatch	C Managerial / organisational constraints
	Regulatory risk	Project risk	Company risk	Country risk		
EU financial instruments	(✓)	(✓)	(✓)	(✓)	✗	✗
	covered by instruments but not used efficiently				**no instruments available**	**mitigation via financial instruments not possible**

5. Closing the Gap – New Instruments Can Take PCI Support to the Next Level

Four measures can help close the financing gap of challenged PCIs

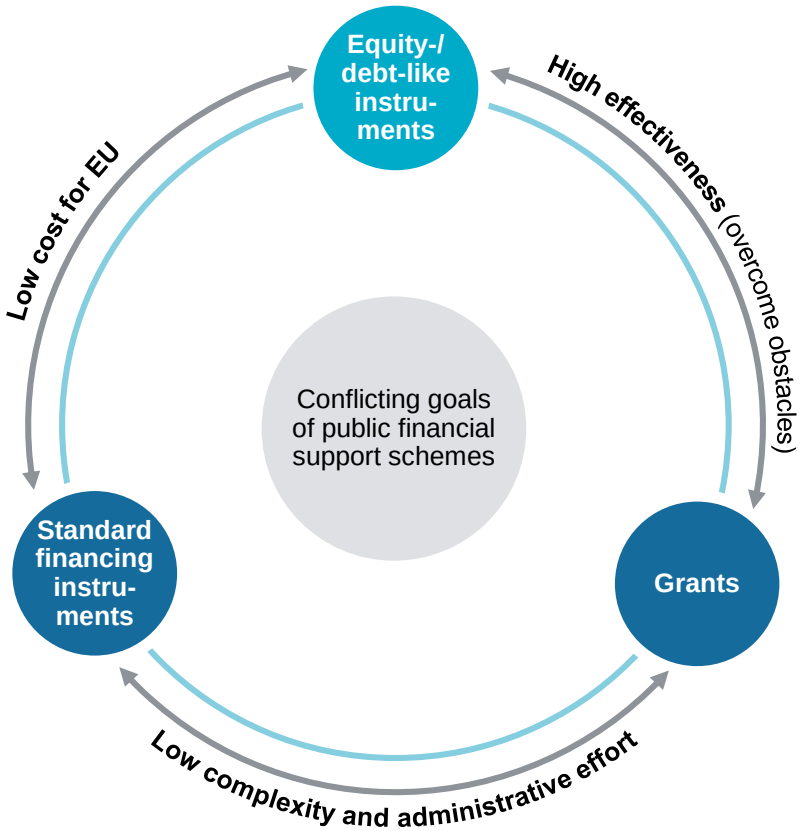
Based on the results of our technical assistance and discussions with TSOs as well as private investors/financial market players, we have developed four measures with great potential to mitigate the prevailing financing challenges of mature PCIs:

> Develop equity- and debt-like financial instruments
> Provide financial engineering support
> Offer capacity building
> Set up special purpose vehicles as a platform for PCI finance

1. Equity- and debt-like instruments combine the benefits of traditional grants and standard financial instruments

Until today grants have played a significant role in closing gaps, especially this is the case if the PCI is not commercially viable within the regulatory framework. The standard procedure of the EU in such cases has been to provide grants for works. Grants, however, carry the inherent disadvantage of being not repayable and thus a very costly means of public financial support.

Figure 8 – Target conflict of public financial support schemes



Equity- and debt-like instruments combine the benefits of grants with those of financial instruments. Equity- and debt-like instruments absorb the risk that public or private investors cannot assume under an infrastructure financing regime (i.e. long duration and moderate interest rates). Thus, just like grants, equity- and debt-like instruments ensure that financially challenged PCIs can be developed according to schedule. The big advantage is that such instruments allow the EU to participate in potential upsides. If a PCI is more profitable than expected, the resulting returns are redistributed to the EU and could be used to support future projects. Hence, the ex post costs of equity- and debt-like instruments are either lower than or (at maximum) equal to the cost of a grant.

Equity- and debt-like instruments offer the same flexibility as standard instruments. Literally every regular financial instrument can be transformed into an atypical one as long as the respective issuer is willing to accept a loss (i.e. allows for a mismatch between risk and return) or is protected from these expected losses by the public. In practice, however, the two most common types of atypical instruments will probably be equity- and debt-like instruments. While the equity-like instrument is more beneficial for the public due to the unlimited upside, the loan option is easier to implement (lower administrative burden) and also more convenient for the beneficiary (no additional shareholder). Debt instruments used for regulation enhancement or volume enhancement (as described in Chapter 4) are just two examples that illustrate how flexible such instruments can be in practice.

Equity- and debt-like instruments could reduce the demand for traditional grants. In effect, they can become grants. As with grants, these instruments should only be used as a last resort to support PCIs for which standard financial instruments are not sufficient (and which would remain non-bankable otherwise). As neither public nor commercial banks offer equity- and debt-like instruments as part of their regular operations, they would require (co-)funding from the public budget. This (co-)funding is meant to compensate the financial intermediary for the expected financial loss that results from the imbalance in the instrument's risk-return profile (returns are insufficient to compensate investors for the risk assumed).

2. Financial engineering helps TSOs to exhaust the full range of public and private instruments and create customised PCI financing solutions

The objective of financial engineers is to fine-tune and optimise existing solutions in cases where the PCI's business model is clear and bankable. In cases where issues of commercial viability and de-risking have not yet been resolved, the main objective would be to explore opportunities to develop a viable solution, or even to assess whether such a solution exists at all. The specific goals of financial engineering support are case-dependent and driven by the maturity and strength of the PCI's business case, as well as the financial position of the TSO (corporate finance approach) or the project company (project finance approach). In any case, financial engineering support would cover the following tasks:

> Develop a comprehensive cash-flow model reflecting commercial, regulatory and legal framework conditions in order to evaluate alternative combinations of financial instruments
> Identify potential investors
> Prepare project documentation packages for investors' due diligence
> General support for investor communications
> Evaluate investment proposals (for equity and debt)

External advisers ensure that regular financing sources are fully exhausted before additional public support is requested. Financial engineering has the objective of maximising volume and risk shares covered by private parties and minimising the need for public financial support, in particular the need for grants. In any case, the EU should absorb a project's high-risk portions only if

absolutely necessary, i.e. when no private investor would take the risk at reasonable cost. Public instruments must remain tools to de-risk projects to a degree that allows private investors to provide the majority of funds.

Financial engineering should be developed into a standard offering. For TSOs applying for work grants above a certain threshold, utilising this form of assistance should become mandatory. The EC could thereby ensure that the full potential of public and private financial instruments had been exhausted before grants were considered. In practice, financial engineering could be delivered either as traditional technical assistance or as part of a broader capacity-building project (see below).

Financial engineering projects are attractive for beneficiaries and public donors alike. On the one hand, TSOs receive support in securing PCI financing agreements on the best possible terms. The EU, on the other hand, ensures that grants are minimised and that public funds are spent in a diligent and transparent fashion. Depending on the individual situation, co-financing technical assistance can be appropriate.

3. Capacity building helps TSOs to enhance their financial management and project development skills while receiving financial engineering support

Managerial and organisational constraints hamper PCI realisation and represent the second most important root cause of project delays besides financing constraints. Due to their cross-border nature many PCIs have an inherent complexity and size that lie outside the typical spectrum of TSOs' investment projects and might therefore exceed their management and delivery capacity.

Technical assistance is an effective solution but lacks long-term impact. Technical assistance is usually provided by a team of external advisers that take over those parts of the project that the TSO cannot address with internal staff – either due to a lack of know-how or merely a lack of sufficient resources. While technical assistance is an ideal tool to address temporary peak demand and to provide expertise for specialist topics (including but not limited to financial engineering), technical assistance has the inherent drawback that the TSOs don't acquire the skills needed to perform future project preparation tasks themselves once technical assistance is withdrawn.

Capacity building provides expertise while systematically strengthening in-house capabilities. It is therefore an attractive option for all cases where TSOs lack practical know-how and experience in tasks which their staffs need to be able to continue to fulfil. Under capacity building, a team of external advisers works together with the TSO's functional staff at the TSO's premises. Working in mixed teams ensures that the consultants' know-how is gradually transferred to their counterparts within the TSO organisation. It involves a systematic training schedule and support for the TSO staff to apply the acquired skills. While this systematic build-up of know-how takes time and therefore requires higher resources than an equivalent project providing only technical assistance, the long-term benefits are clear: By working in joint teams and receiving training on the job, materials, check-lists etc., the TSO will be less dependent on external support for large investment projects in future.

Capacity building is an add-on service in addition to financial engineering support (see above). The right balance of capacity building and technical assistance ensures that a project can be realised on time, within budget and at the required quality, while also leaving the TSO with a stronger in-house capacity for project development and management than before.

The capacity building approach is not limited to the energy sector, but can likewise be applied to projects related to the Trans-European Transport Networks (TEN-T) or the Trans-European Telecommunications Networks (eTEN). Hence, capacity building projects should aim at establishing

functional and technical know-how which can be transferred to all large infrastructure investment projects in the respective countries.

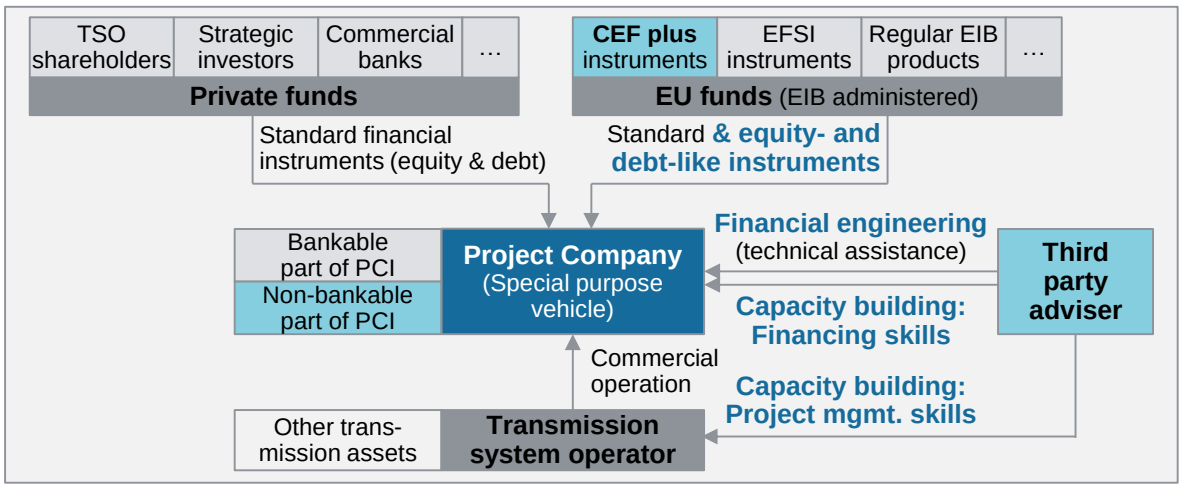
4. Special purpose vehicles (SPVs) provide a unified solution that integrates financial engineering, different financial instruments and capacity building support

SPVs are project companies that separate the PCI from the TSO's other assets. The SPV is an independent legal entity set up to fund and own one or multiple PCIs. Legal separation is required to isolate the PCI from the TSO's remaining operations and thereby create a risk structure that is only determined by the business model of the PCI itself.

SPVs are versatile structures that integrate different financial instruments. This high degree of freedom in financial structuring is again a consequence of legal separation. Financial engineers from a third-party adviser can develop an optimal financing solution without being constrained by the TSO's current financing structure, existing financing contracts or other operations. In a first step, experts analyse the risk structure and determine which part of the PCI qualifies for regular infrastructure financing and which part, if any, is not bankable. Subsequently, the project is subdivided into different risk tranches which are then allocated to investors according to their individual risk preferences and return requirements. In their attempt to optimise the overall financing structures, financial engineers may draw on all types of financial instruments including equity, mezzanine finance, debt and guarantees. If parts of the SPV – or more specifically the underlying PCI – are not bankable, equity- and debt-like instruments could be used as well.

SPVs open up capital market access for TSOs with an insufficient credit rating. As the SPV enjoys complete legal separation from the TSO, it can receive an independent credit rating, a necessary precondition for capital market access. SPVs with a sound credit rating are attractive investment targets for insurance companies, pension funds and other investors searching for (very) long maturities and predictable returns.

Figure 9 – SPV as an integrating element



In order to keep administrative expenses low, SPVs should be set up as lean as possible. The most basic SPV type is organised as follows: The SPV ("Project Company") and TSO enter into a contract that covers financing, construction, operation, and ownership transfer upon contract expiration. This contract also regulates provision and use of funds as well as coverage and

allocation of previously identified project risks. In order to protect the interest of investors, this financing contract should also be aligned with the regulator. Some jurisdictions may require approval by the regulator. In addition to the principal contract with the TSO, the SPV enters into additional (standard) financing contracts with investors. In some cases, direct contracts between investors and the TSO might be required as well. Once set up, the administrative effort is negligible: Financial transactions are limited to disbursement and repayment of principal, interest payments and reimbursement of expenses. In most cases, operational responsibility for the PCI remains with the TSO.

The detailed structure of the SPV depends on individual framework conditions and can therefore only be determined on a case-by-case basis. The configuration of an individual SPV is influenced by the character of the PCI, the maturity of the national capital market, regulation (in particular with respect to asset ownership), the TSO unbundling model, tax laws, planning and building laws, environmental laws, and investors' requirements. Examples of the usage of SPV structures in PCI promotion and financing include the electricity interconnection project between Lithuania and Poland and the gas interconnection project between Greece and Bulgaria.

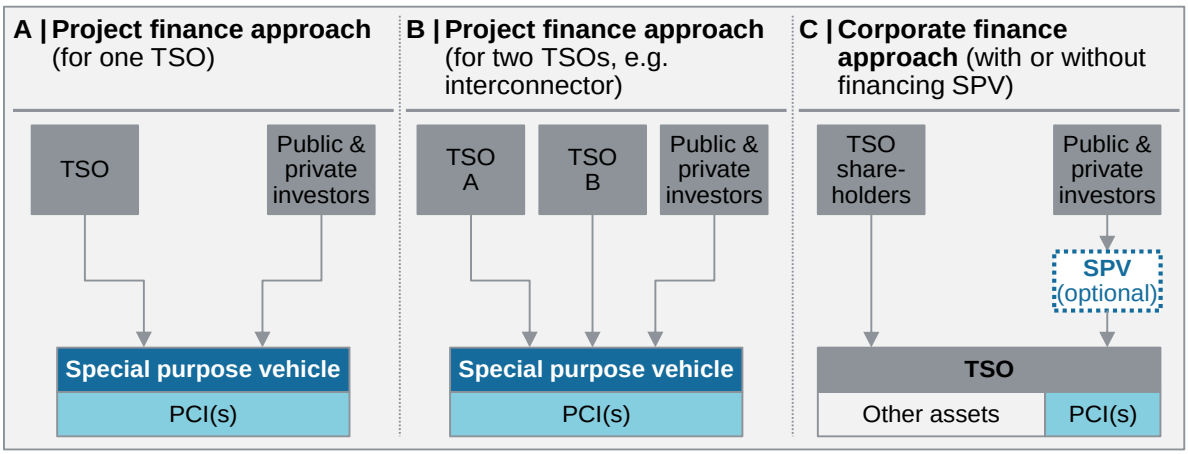
There are three key options for setting up the SPV:

> **A | Project finance approach:** For PCIs that can be isolated from the TSO's remaining assets, the SPV can own the PCI directly. The SPV generates revenues through a lease agreement with the TSO or through independent regulatory payment streams (to be agreed with the regulator). With this arrangement, SPV investors (including the TSO) have direct control over the asset. A project finance approach is clearly the preferred structure from an investors' perspective for legal separation and asset ownership.

> **B | Project finance approach for interconnectors:** Here the set-up is identical to the previous case, except that multiple TSOs and jurisdictions are involved, which increases complexity.

> **C | Corporate finance approach:** Public and private investors enter into financing contracts with the TSO as well as additional inter-creditor agreements with each other. The PCI remains an integral part of the asset base. In contrast to full legal separation, investors are not effectively protected against bankruptcy of the TSO. However, an SPV structure might add value under a corporate finance approach as well. This is especially the case when the SPV could achieve a higher credit rating than the TSO alone (e.g. with the use of equity- and debt-like instruments), or if negotiations with a large number of existing creditors can be streamlined by bundling PCI finance via the SPV.

Figure 10 – Exemplary SPV structures for different contexts



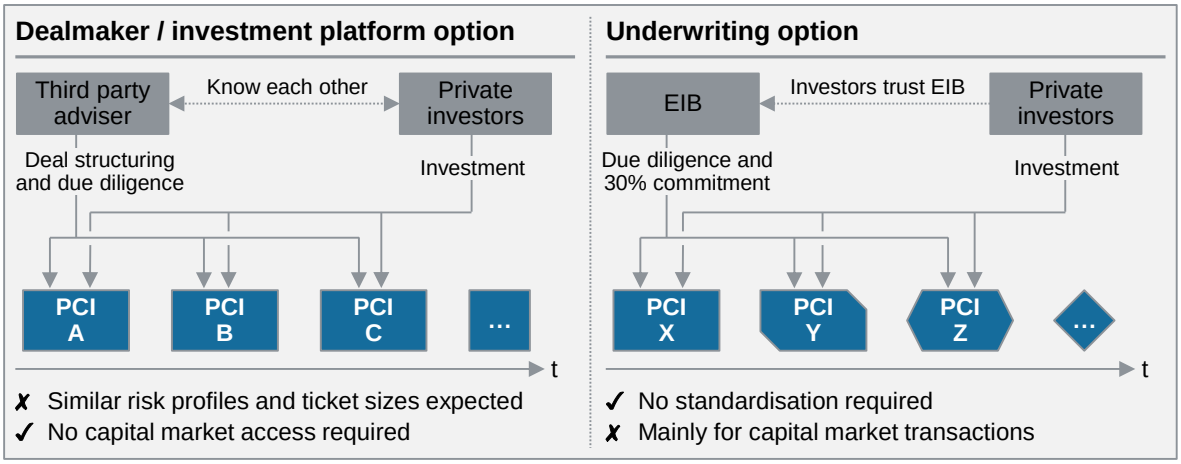
Project companies are particularly interesting investment targets for private infrastructure investors

Investment platforms and underwriting can maximise the commitment of private investors and thereby improve the TSO's likelihood of receiving the best possible financing deal as well as keeping public contributions at the necessary minimum. While both approaches attempt to comfort investors and attract capital based on trust relationships, the two are fundamentally different. Each has characteristic benefits and drawbacks:

> **Dealmaker/investment platform option:** A third-party adviser who also provides financial engineering support uses his established business relationships with partner investors to ensure sufficient interest for investment in the PCIs (or the corresponding SPVs). In this case, consistently high demand for PCI investments is ensured by tailoring financial structures towards the target risk profiles of partner investors. Moreover, the third-party adviser provides its partners with a well-structured, standardised due diligence. In combination, these measures can be expected to have a positive effect on financing costs, as partner investors' own efforts are minimal. The clear benefit of this option is that capital market access by the SPV is not required. The main drawback is that a certain degree of standardisation is needed in order to achieve economies of scale for the partner investors and thereby reduce costs.

> **Underwriting option:** In this case, the role of dealmaker lies with the European Investment Bank. The EIB and possibly a third-party adviser structure the SPV. The senior debt tranche of the SPV is securitised and offered to capital market investors as a corporate bond. The EIB acts as (lead) underwriter and commits to purchase a certain fraction of the issue volume, usually 30%. If demand from capital market investors is sufficiently high, the EIB can reduce its own share in the issue and make room for additional private capital. By acting as underwriter and committing to a certain volume share, the EIB signals to the capital markets that it believes in the quality of the investment. While not mandatory, an investment-grade rating would certainly increase investors' interest in the bond issue even further. Compared to the dealmaker approach, the main benefit is that the EIB is not confined to a standard SPV structure. The drawback to this approach is that it requires capital market access and therefore a sufficiently large transaction volume.

Figure 11 – Approach to maximise appeal for private investors



6. Outlook – Next Steps to Optimise PCI Financing

To accelerate PCI realization we suggest developing equity- and debt-like instruments and extending financial engineering and capacity building support

We suggest that a team of EIB and EC staff jointly explore the potential for equity- and debt-like instruments and define terms and conditions. An assessment of the political will to establish a third category of support instruments positioned between regular financial instruments and grants will need to be conducted. Subsequently, we suggest developing suitable organisational and financial structures (funding) to accommodate these special financial products. A key success factor will be the integration of these instruments into the existing financial support framework and to define conditions under which they are preferable over grants. An ex post evaluation of grants for works already paid out under CEF can yield first insights.

The further design and alignment on such new financial instruments is, however, is a process that will probably have an effect in the medium term. To accelerate PCIs realization now we recommend continuing to support eligible TSOs by providing technical assistance for financial engineering as well as capacity building.

Pilot projects can prove the effectiveness of financial engineering and capacity building support and can provide valuable insights for the development of permanent support instruments. While this field study defined financing structures for selected PCIs and provides insights and a way forward on financial engineering, the full potential of their effect can better be demonstrated in pilot projects where a given PCI/TSO is supported from the project development phase through to the final investment decision and up until project commissioning and commercial operation.