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Financing Investment in the European Electricity Transmission Network: Consequences on Long-Term Sustainability of the TSOs Financial Structure

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Highlights[2]

- European electricity TSOs will have to achieve substantial capital expenditures over the next two decades. Their current financing strategy will not be adapted to these unprecedented costs. Even in a 'best-case' scenario of full cooperation between the different national and regional TSOs, it will result in constraints on the volume of investment achievable.

- Under current trends in the evolution of transmission tariffs, the investment programs that are currently planned will be unsustainable in the long-term. To avoid severe degradation of the TSOs financial profile, a significant increase in tariffs will be required.

- Alternative financing strategies, such as issuing additional equity, or restraining dividends, could help achieving the whole-scale investment volumes at a lower cost for consumers. However these financing strategies cannot substitute fully to an increase in tariffs. A very radical shift in the financing strategy would only allow a slightly higher share of the investment plans to be financed, at the expense of a reduced return-on-equity. Injecting capital in the transmission business would not remain attractive under such conditions.

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2. This Policy brief is based on the Florence School of Regulation (RSCAS) Working Paper 2013/27, available at http://fsr.eui.eu

1. Background: The financeability challenge

1.1 The need for investment in the European transmission grid

The European Transmission System Operators (TSOs) will face unprecedented capital expenditures over the next decades. This need for investment has two main drivers. On the one hand, the development of the European electricity transmission grid is to play a key-role in the strategy of the European Union, to address challenges such as the accommodation of large-scale renewable sources of energy and market integration. On the other hand, a major share of the existing network is to be renewed in the coming decades (IEA 2011).

The resulting volumes of investment will be challenging for TSOs. The ten-year plan established in 2012 by the European Network of Transmission System Operators for electricity (ENTSO-E) for instance mentions investments of €104 billion to be spent in the next ten years for projects of pan-European significance alone. Even with plans by European TSOs to raise their investments by approximately 70% compared to the period 2005-2009, there would still be a significant financing gap to be met (Roland Berger 2011).

1.2 TSOs financing strategies: options and limits

Financeability hereby refers to the ability of TSOs to raise finance from capital markets in order to meet their investment program. It implies that the TSOs conserve adequate financial ratios, corresponding to an investment grade status for rating agencies (See Box 1 for a description of the ratios we took into consideration in this study). In addition, the return on the regulatory asset base must be sufficient to cover the costs of capital of investors.

There are three basic ways in which TSOs can finance capital expenditures: investors can raise debt, fund investment internally by retaining earnings, or find external sources of equity.

Since liberalisation, **debt emission** has been the option most commonly employed by integrated utilities in general and European TSOs in particular (IHS CERA 2013). As a result, the volume of debt has kept rising, and the leverage of European electricity TSOs is typically about 60-70% today, which limits the ability of these companies to acquire further debt without losing their credit rating.

Internal equity is a major source of financing for some small European TSOs, but it cannot be sufficient alone at times when the investment needs increase significantly. Moreover, investors in TSOs traditionally expect a high dividend payout ratio, which limits the ability of TSOs to finance investments internally.

Raising external equity is an attractive option when the debt level has to be kept under a given threshold. Yet it is also a more expensive option. In addition to higher costs, there are two main obstacles to financing investments by injecting external equity, due to the fact that most European TSOs are still publicly owned[3] (Roland Berger 2011). Cash-strapped European States are not able to inject liquidities themselves, and States might also be reluctant to dilute their ownership share of crucial assets with major public goods properties.

Box 1: A tailor-made quantitative approach to financeability

In order to assess the quality of the financial ratios of the single TSO, we used the methodology employed by the rating agency Moody's to establish the rating of companies developing regulated electric and gas networks (Moody's 2009).

We focused on the main quantitative metrics used by the rating agency Moody's. Each of them account for 15% of the overall rating, and about 40% of the quantitative part of the rating. The **adjusted Interest-Cover Ratio** is calculated as Earnings before Interest and Taxes (EBIT) divided by interest payments: it reflects the **flexibility of the regulated TSOs to pay interests on their debts.** The **Gearing level** is calculated as the volume of debt divided by the total value of the Regulated Asset Base: it represents the **loan to value ratio**.

2. Main assumptions behind our calculations

2.1 Focus on a virtual integrated TSO

In order to identify constraints at the scale of the European transmission grid industry, we considered a best-case scenario, for which **full cooperation (or integration) between the national or regional TSOs** would be achieved. We hence made the assumption that the different European (i.e. members of ENTSO-E) TSOs could be virtually aggregated into a single European TSO, facing the whole volume of investments.

Note that, when relaxing this assumption, smaller TSOs facing significant investment needs and ownership-restrictions might be exposed to more challenging local constraints that would not appear in this study.

3. Even in situations of private ownership (as in Belgium, Italy and Spain), public entities still hold a large minority share.

Box 2: Estimation of the required capital expenditures over 2012-2030

Each of our scenario features a scenario for new developments, as well as a scenario for infrastructure renewal.

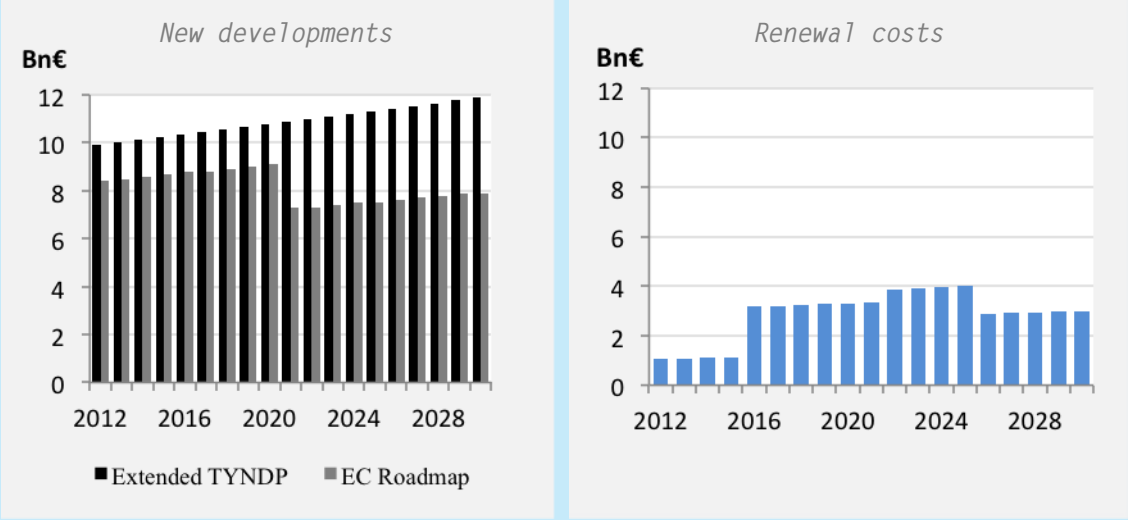
Two alternative scenarios for investments related to new projects

The first scenario (**'Extended TYNDP'**) was based on the ten-year network development plan published by ENTSO-E for the period 2012-2021. We extended this scenario by considering investments needs would follow the same trend until 2030. The total volume of investment by 2030 would amount to **€ 207 billion**.

The second scenario (**'EC roadmap'**) was based on the Impact Assessment of the Energy Roadmap 2050 published by the European Commission in 2011 and featured investment needs equal to **€ 155 billion** by 2030.

One complementary scenario for infrastructure renewal

A major share of the existing infrastructure will have to be replaced in the coming decades. We used the results of calculations realised by the IEA in its World Energy Outlook 2011, and subtracted savings realised thanks to investment in new projects. The resulting need for investment would amount to **€55 billion by** 2030.



Annual investment costs in the ENTSO-E area over the period 2012-2030 (€2012 Billion)

2.2 Calculation of revenues and tariffs

In this study, the **volume of investment is exogenously determined and is independent from the financing strategy**. A detailed description of the investment profiles employed can be found in Box 2.

It was assumed that both **operating expenditures and capital expenditures would be directly passed through to consumers**. Costs related to the provision of system services were excluded, but losses and other network-related OPEX were taken into consideration[4]. Tariffs were then determined as the sum of these costs and of a fixed return-on-assets.

We also referred in our analysis to "current trends in the evolution of transmission tariffs". In this case, the annual growth of tariffs is limited to the average increase in the ENTSO-E area over the last 3 years, i.e. CPI+1.04%.

3. Results

3.1 Results in the BAU scenario

Under the financing strategy applied in our ***business-as-usual (BAU) scenario***, there is no injection of external equity into the TSO, and the pay-out ratio is equal to 70%.

Our results indicate that there is a clear financeability issue: with a financing strategy purely based on debt emission, and with a rise in tariffs limited to current trends, both investment scenarios would lead to a severe degradation of the TSO financial status. **If an investment-grade were to be maintained under the current trend in tariffs, it would**

4. More details regarding the calculations made can be found in the corresponding article.

only be possible for the TSO to develop 47% of the new investments planned in the TYNDP scenario, and 61% of the EC Roadmap scenario.

We estimated the **increase in tariffs required to ensure the financeability of 100% of our first investment scenario (extended TYNDP) to be equal to an annual rate of CPI+3.4%, roughly three times the trend observed in the past years**. Similarly, ensuring financeability of our second investment scenario (EC Roadmap) would require an annual increase in tariffs equal to CPI+2.1%.

Note that the two most important sources of increase would be depreciation and interests payments, with rise of dividends only accounting for a minor share of the total increase.

3.2 Alternative financing strategies

We then studied the impact of two alternative financing strategies to achieve a higher share of the investment program while keeping tariffs at a lower level.

In the ***"Issue additional equity"*** scenario, the high dividend pay-out ratio is maintained but the TSOs issue additional equity (instead of debt) to finance capital expenditures.

In the ***"Shift to growth model"*** scenario, the dividend pay-out ratio is lowered and TSOs retain earnings in order to finance capital expenditures internally. Shareholders do not receive their return as cash but from holding the share for a while and selling it at a higher value.

By increasing the equity share (whether internally or externally), it is possible to finance a larger share of investments program while conserving an investment-grade. Yet, as the costs of interests on debt are fixed and lower than the costs of equity, injecting further equity while maintaining tariffs at the same level will result mechanically in reducing the ROE. **The extent to which external sources of equity can be used to finance large-scale investments without increasing tariffs is therefore limited.**

However, **by injecting a small share of external equity, or retaining a slightly higher share of the earnings, it is possible to achieve the whole scale of the investment program while conserving the same return on equity and reducing the needed increase in tariffs.**

In the case of external equity injection, the optimum is reached for relatively small level of equity injections, as illustrated in Figure 1. In order to achieve a 8% post-tax nominal ROE, the minimum annual increase in tariffs is obtained for equity injections equal to 8% of financing needs, which amount to €10 billion over the time period 2012-2030. In order to achieve a 10% post-tax nominal ROE, the minimum annual increase in tariffs is obtained for equity injections equal to 4% of financing needs, which amount to €5 billion over the time period 2012-2030.

Similar results can be obtained for the *shift to growth model* strategy. In order to achieve a ROE equal to 8%, the optimum is found for a dividends pay-out ratio equal to 55%. In order to achieve a ROE equal to 10%, the optimum is found for a dividends pay-out ratio equal to 65%.

Note that in any case, a significant rise in tariffs would still be required to achieve the whole scale of the investment programs.

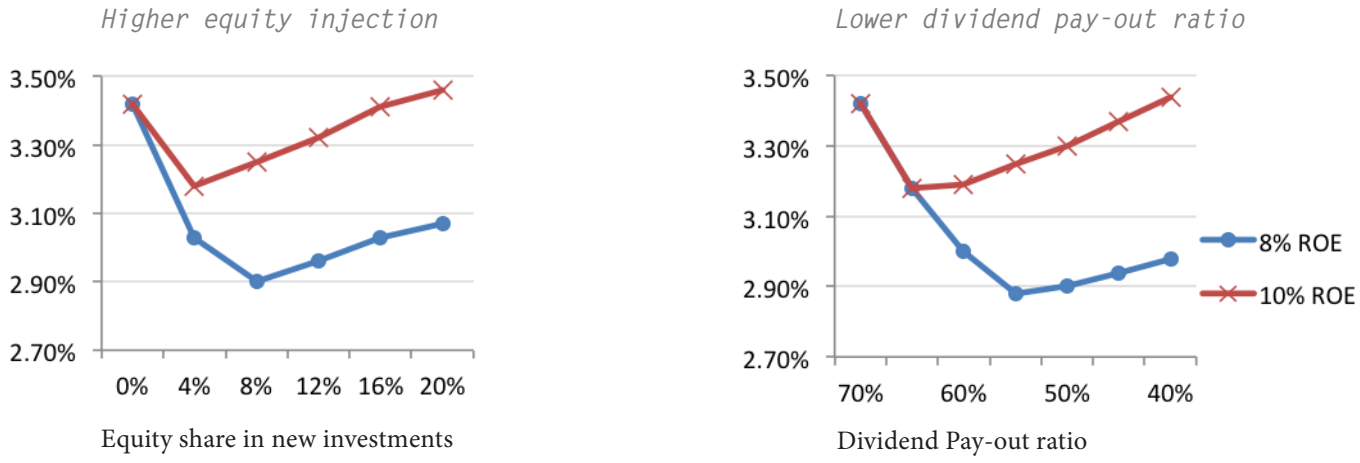


Figure 1: Average annual increase in tariffs required over the period 2012-2030 to achieve a given average ROE while conserving investment grade for different financing strategies in the 'Extended TYNDP' scenario

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4. Policy implications

In this article we looked at the issue of financeability of investments in the transmission network with a different angle from existing works. More traditional issues include identifying and allocating costs and benefits, delivering adequate incentives to TSOs, or getting access to debt at reasonable costs. Our analysis revealed that in addition, **even if all these challenges were solved, there could still be limits on TSOs' ability to meet the need for investments.**

Pure debt financing will lead to a threat that the volume of the debt might become too important for TSOs to face repayments. This situation is reflected in the degradation of key financial metrics. It means that TSOs' ability to meet their obligations would then be vulnerable to small perturbations of the allowed rate-of-return. **Financing institutions will only accept such a situation if the regulatory frame is very stable and if returns are guaranteed in the long-term.** Rules put into place should in particular minimise the eventuality of a regulatory hold-up.

Besides, according to our results, the business-as-usual financing strategy of TSO will not be the most adequate strategy to finance a significant wave of investments. **Consequential savings could be achieved by resorting to alternative financing strategies. The implementation of these strategies will require an evolution of the perception of TSOs owners** (mainly public entities), for instance opening TSOs to external sources of equity, and to new kind of investors attracted by growth entities.

In any case, an increase in investment will lead to a significant increase of costs, mostly to cover depreciation and interest payments. Transmission tariffs only constitute a small share of the total costs of electricity for consumers, but a three-fold increase of their annual growth might nevertheless generate protests. It is important not to sacrifice significant benefits in the long-term to limit spending in the short-term. Similarly, it is key to make sure that the need for important sources of financing is perceived as being associated to real needs and not a result of bad management and costs getting out-of control.

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