European University Institute

ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES

Loyola de Palacio Chair

Getting the European Electricity Transmission Infrastructure Financed

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FEEM-IEFE Joint Seminar Series
06 June 2013

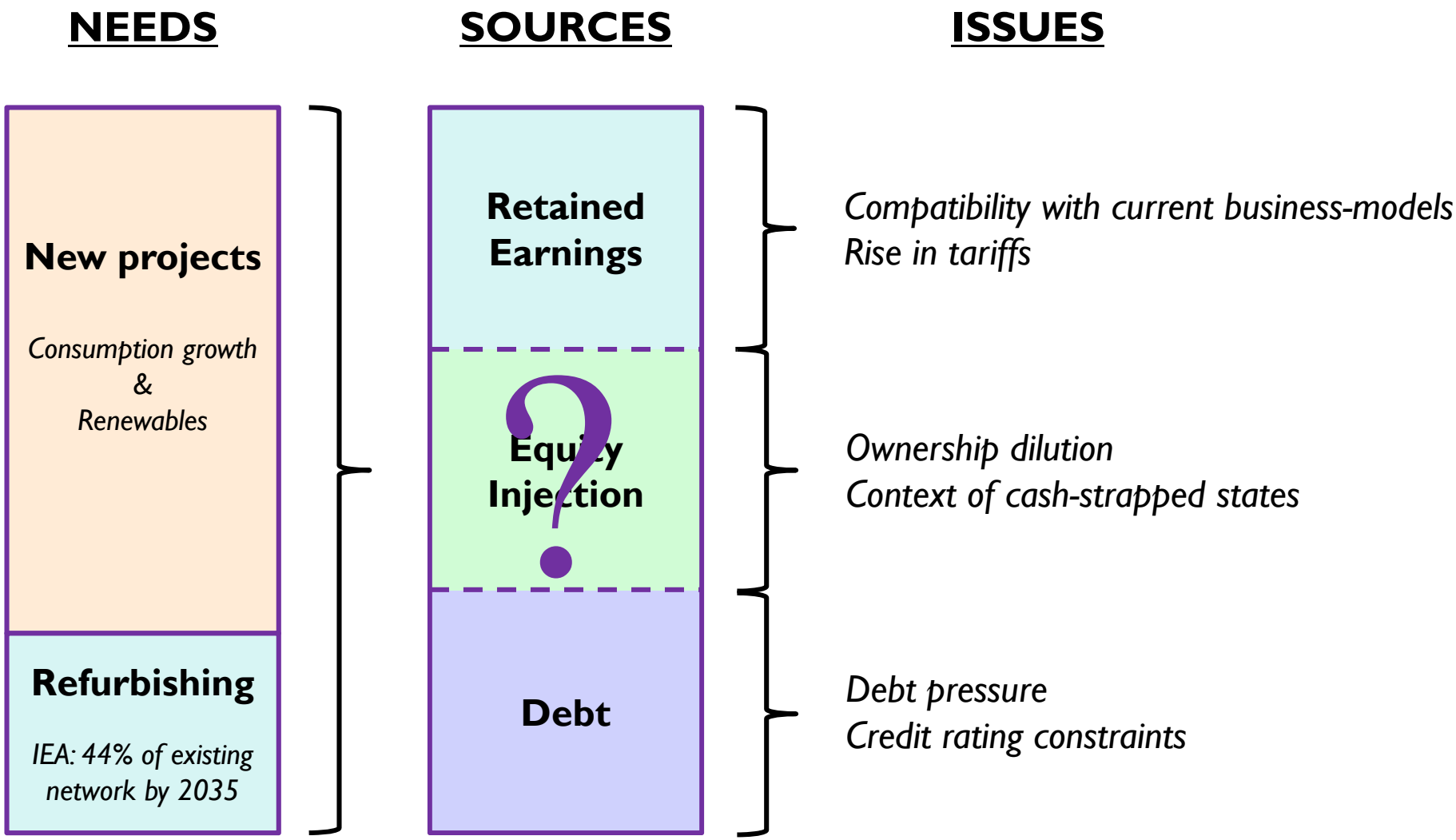
Agenda

1. **GENERAL FRAMEWORK**
   THE FINANCEABILITY CHALLENGE

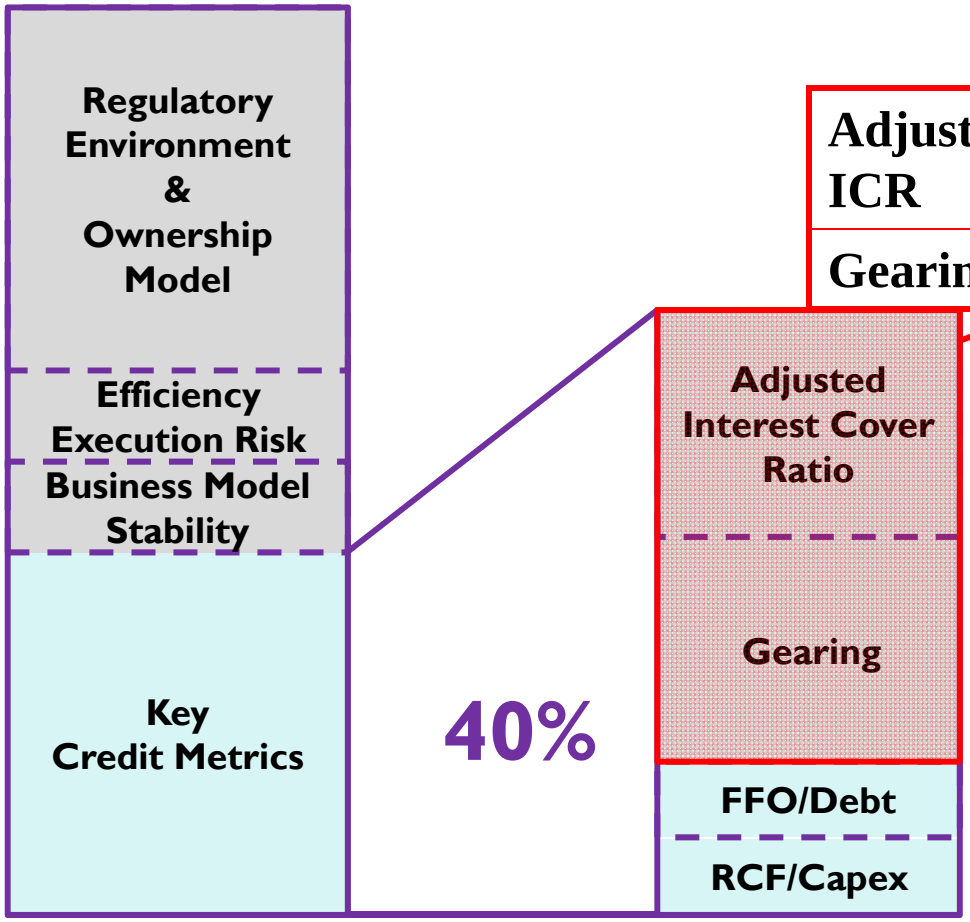
2. **BUSINESS-AS-USUAL**
   LONG-TERM SUSTAINABILITY OF INVESTMENT PROGRAMS

3. **ALTERNATIVE FINANCING STRATEGIES**
   IMPACT ON COSTS FOR NETWORK USERS

General framework
Challenging volumes of investments



General framework
Definition of credit rating standards



	Higher Standard	Lower Standard
Adjusted ICR	≥ 4 : Aa	≥ 2 : A
Gearing	≤ 60% : A	≤ 75% : Baa

15% = *"Ability to pay interests"*

15% = *"Loan to value ratio"*

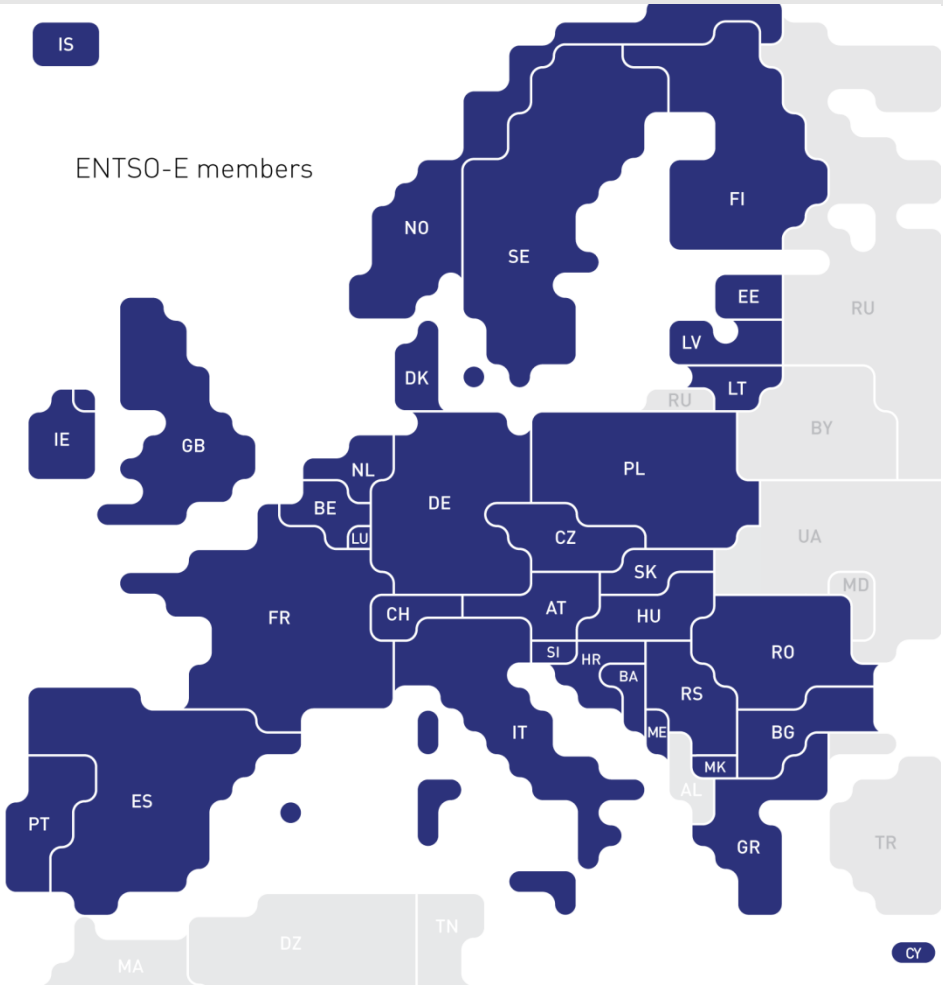
5% = *"Ability to cover debt repayments"*

5% = *"Ability to fund investments internally"*

Based on Moody's methodology for Regulated Electric and Gas networks

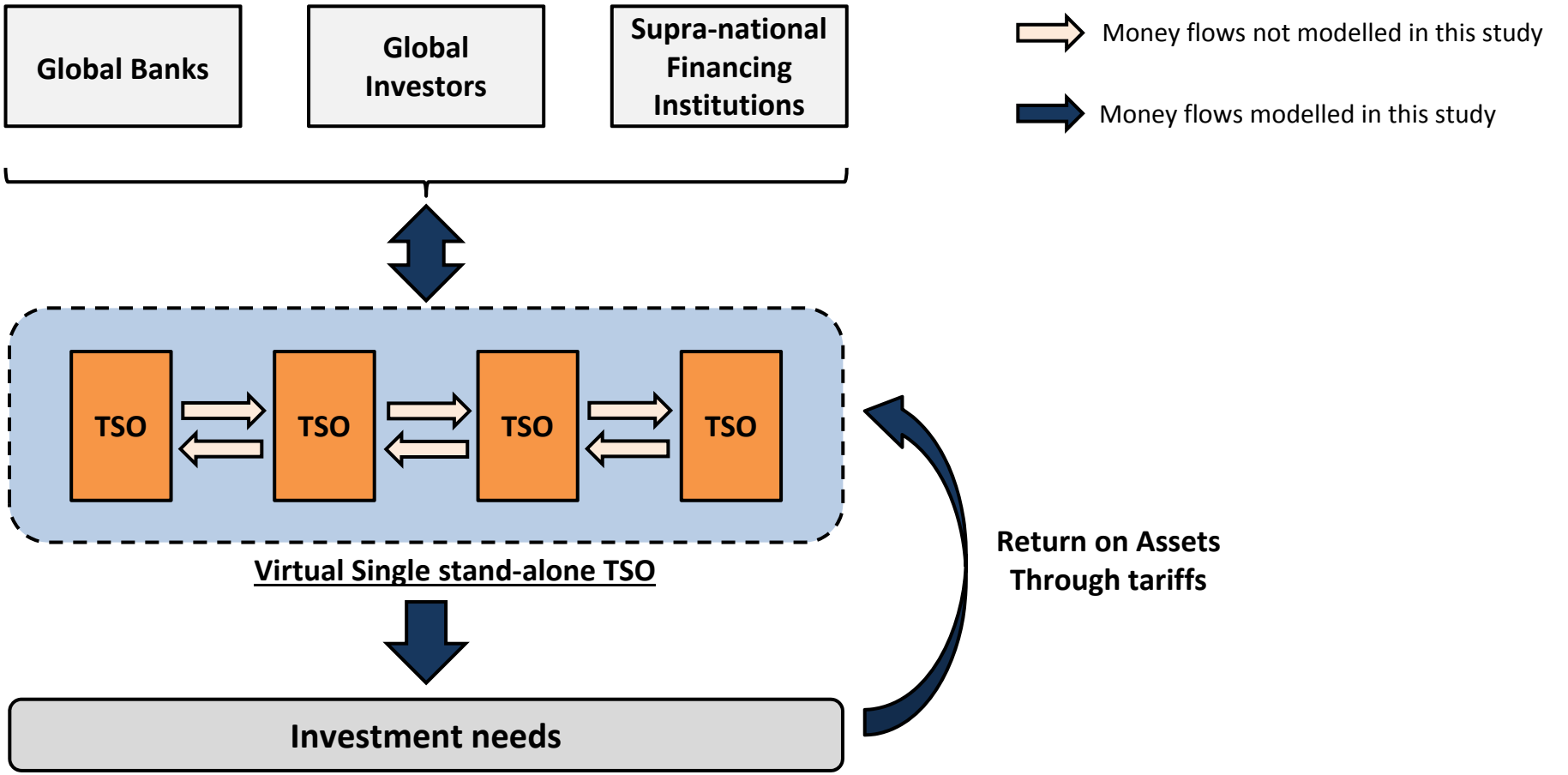
General framework

Assumption of a virtual single European TSO



2012-2030

General framework
Assumption of a virtual single European TSO



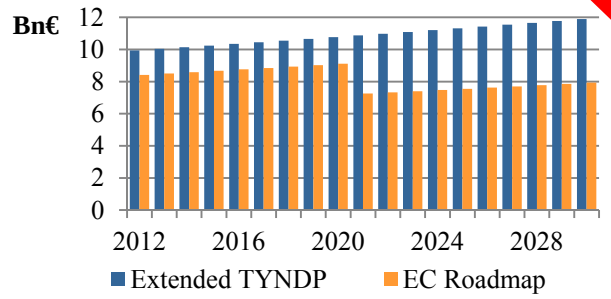
- **NB: Situation might be worse for smaller TSOs facing high investments needs.**

Results in the Business-as-usual scenario

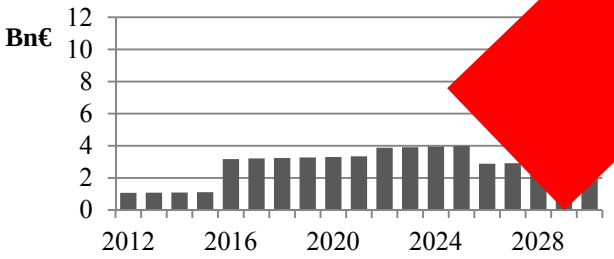
Business-as-usual scenario

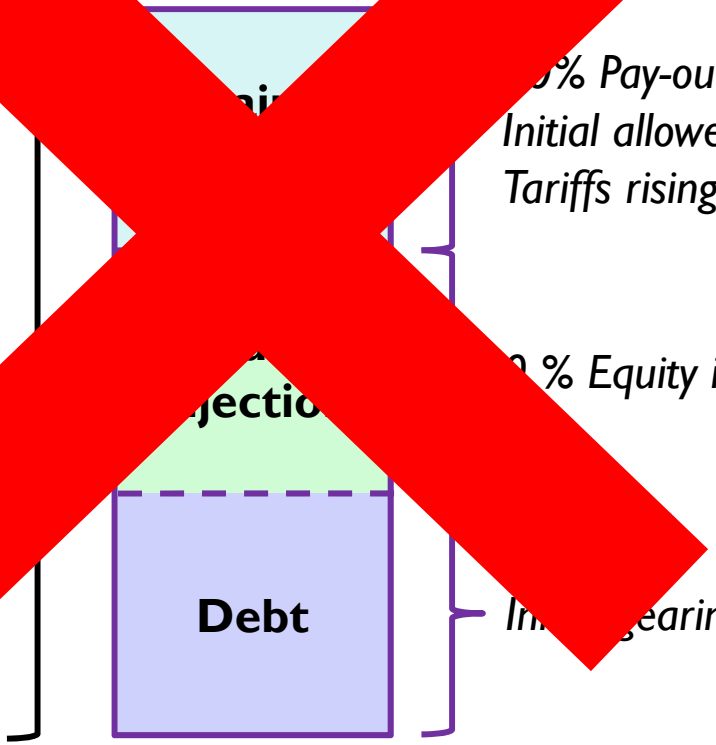
Annual costs in the ENTS
2012-2030 (€2012 Billio

New Projects: 155/207 Bn over 2012-2



Refurbishing: 55 Bn over 2012-203





% Pay-out ratio
Initial allowed return on assets= 7.5%
Tariffs rising annually by CPI+1.04%

% Equity injection

In earing = 58.9 %

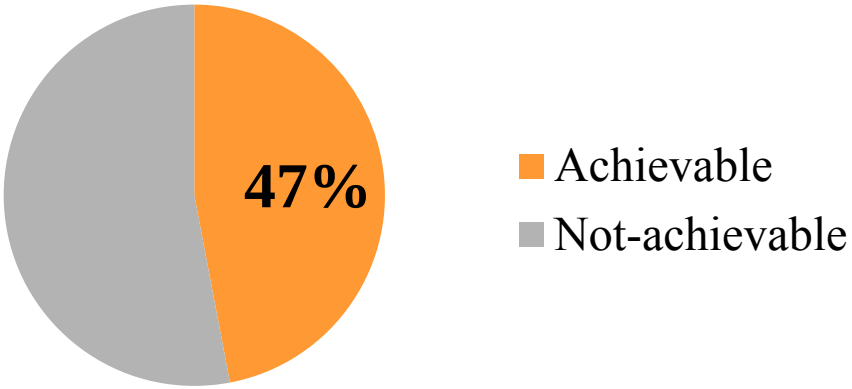
⇨ **Loss of the investment grade within ten years.**

Results in the Business-as-usual scenario

What investment volume under current tariffs evolution?

- Rise in tariffs limited to **CPI+1.04%** after 2012

Extended TYNDP



- Nominal post-tax ROE: **7.2%**
- Nominal pre-tax ROA: **6.1%**
- **€ 41billion** of new debt

- **Financing gap corresponding to half the new investment needs.**
- **The higher standard cannot be maintained in any case.**

Results for variants
Variant Toolbox

Debt

Internal Equity

External Equity

- **Three natural variants:**

Retained Earnings

- Revenue uplift
- Higher pay-out ratio

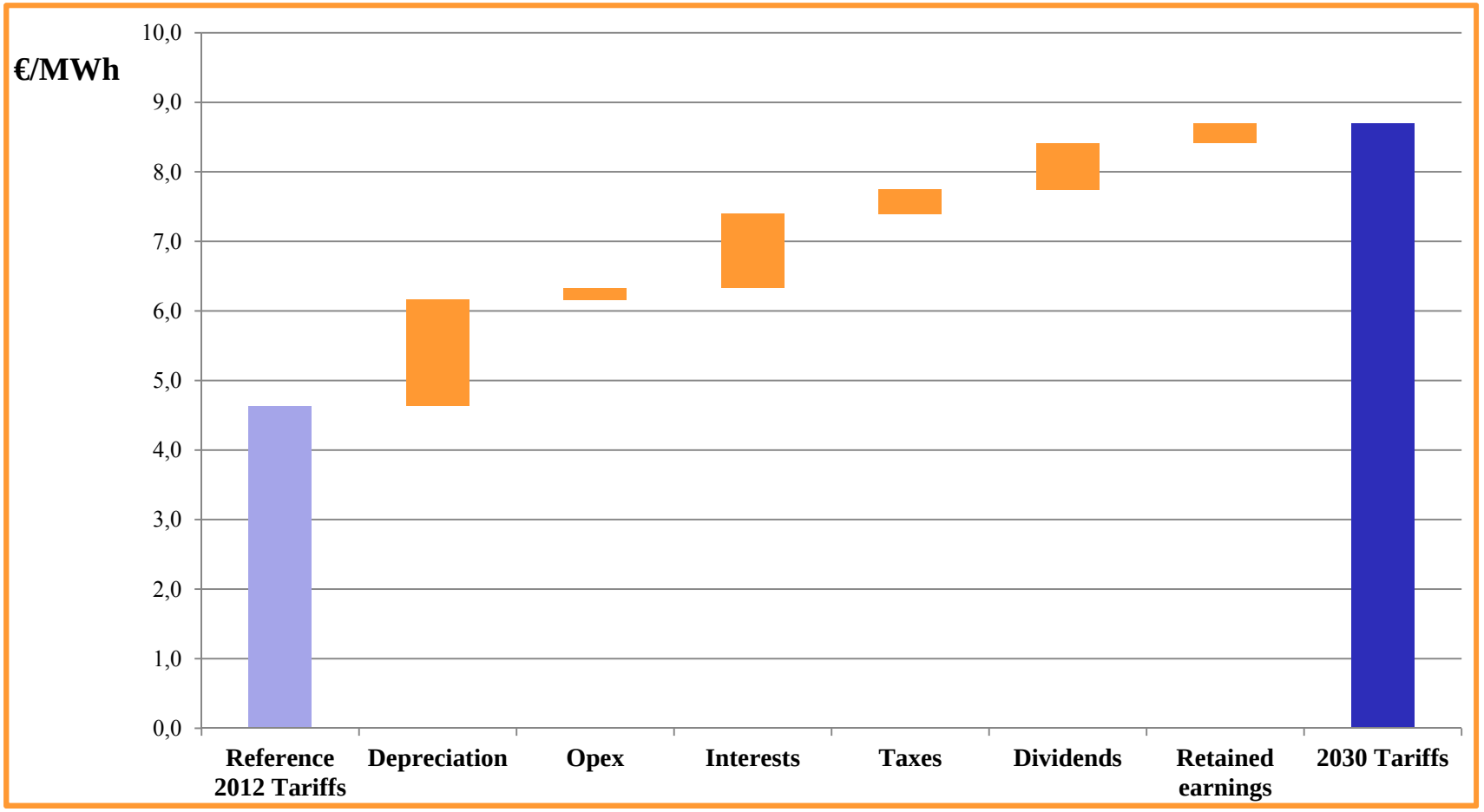
Equity Injection

- Additional equity injection

Results for variants

Revenue uplift: which tariffs to achieve 100% TYNDP?

Evolution of tariff components between 2012 and 2030

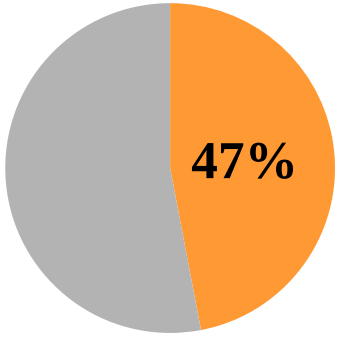


Results for variants

What investment volume under current tariffs evolution?

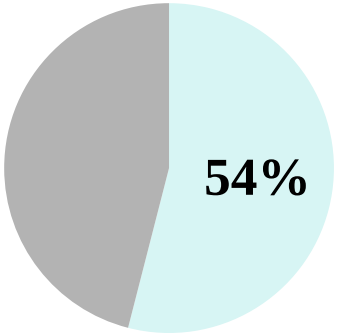
- Extended TYNDP scenario / Rise in tariffs limited to **CPI+1.04%** after 2012.

BAU



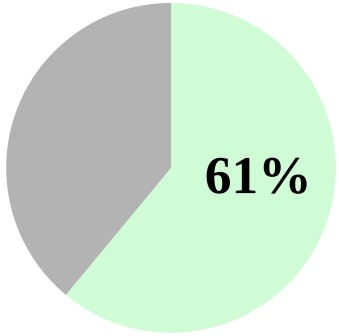
- Nominal post-tax ROE: **7.2%**

30% Pay-out



- Nominal post-tax ROE: **5.8%**

50% Equity injection



- Nominal post-tax ROE: **5.0%**

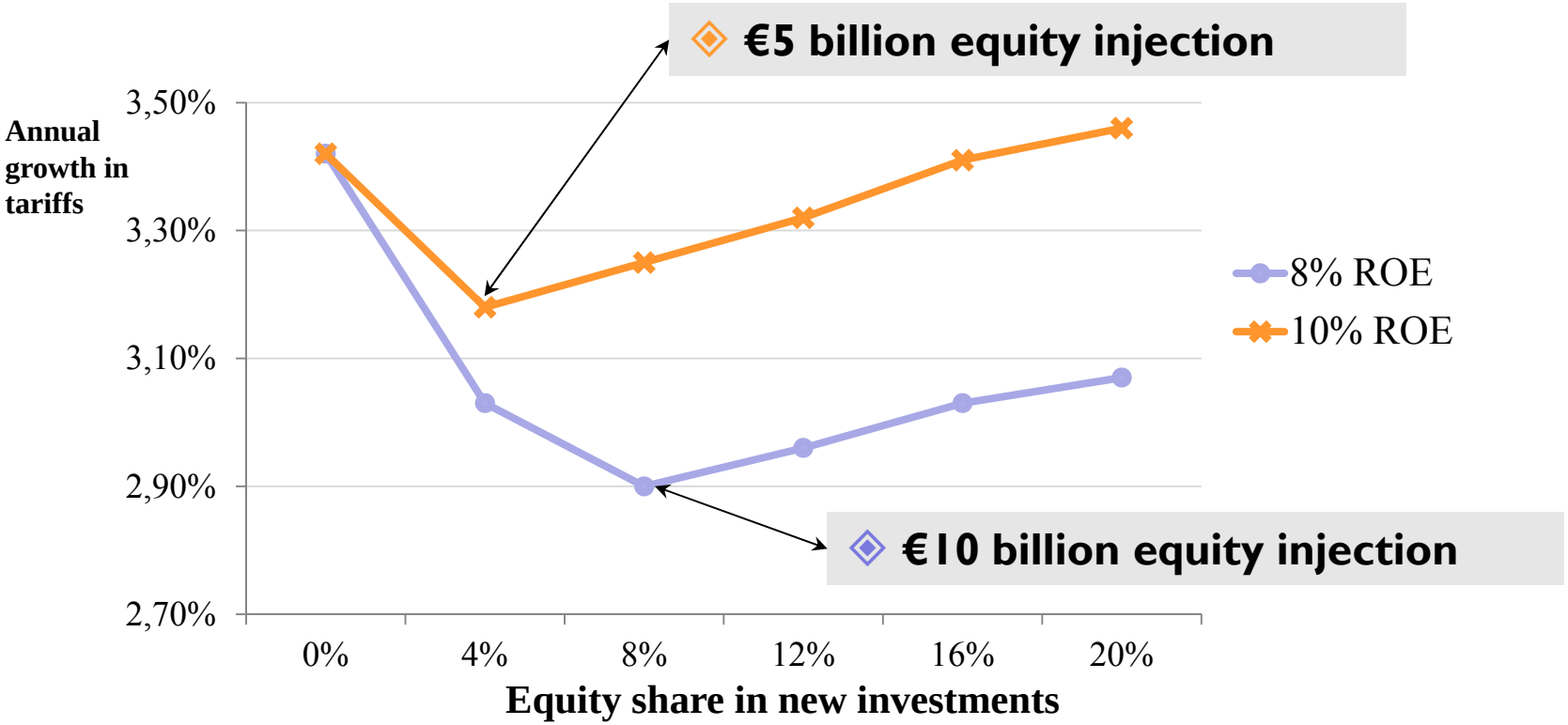
- **Slightly higher share of the investment program theoretically achievable... BUT mechanically reducing the return of investors.**

⇨Higher equity needs not compatible with lower ROE.

Results for variants

Equity injection: which tariffs to achieve 100% TYNDP?

- **Releasing constraints** on financial ratios vs. **Higher cost** for equity

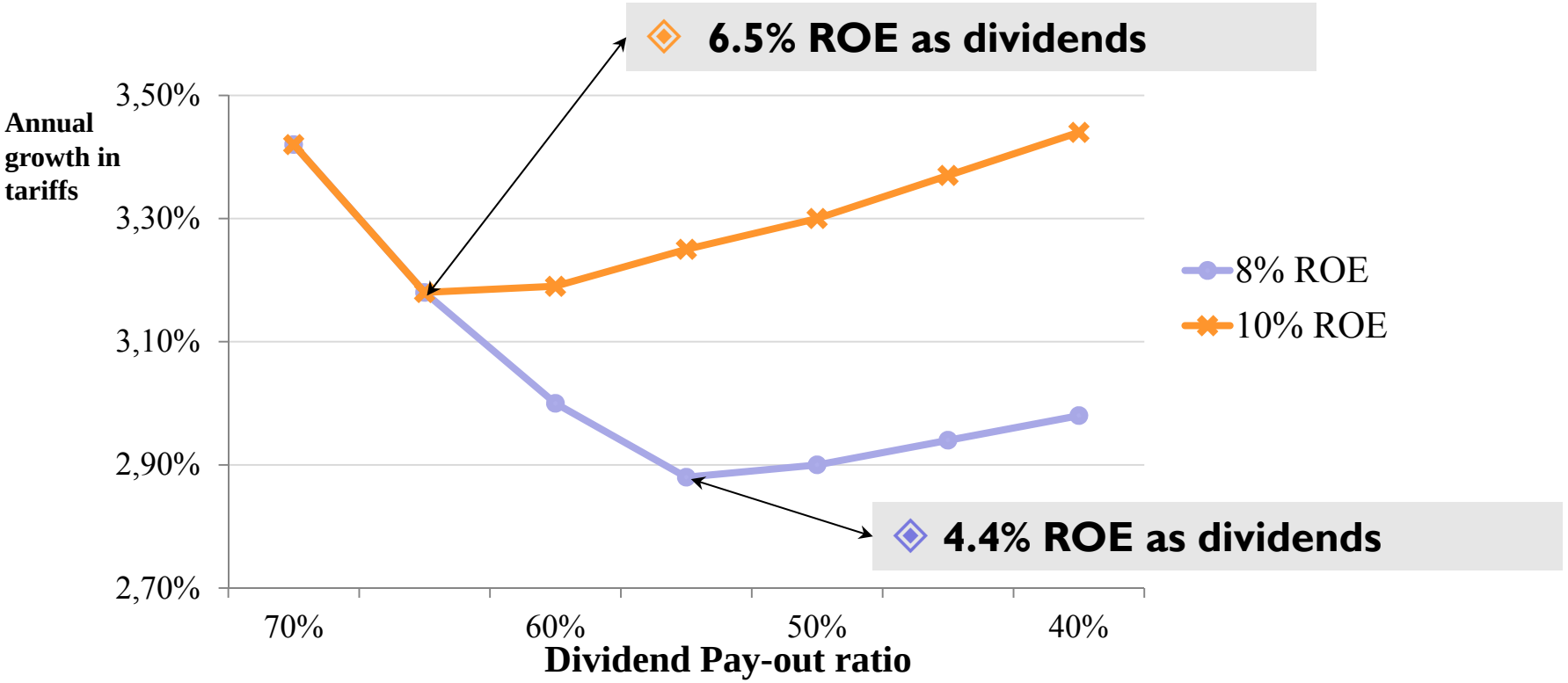


- **Possible to achieve the whole investment program with lower impact on tariffs and a constant ROE.**
- **Optimum reached for relatively small amount of equity injection.**
- **Tariffs will have to rise significantly anyway !**

Results for variants

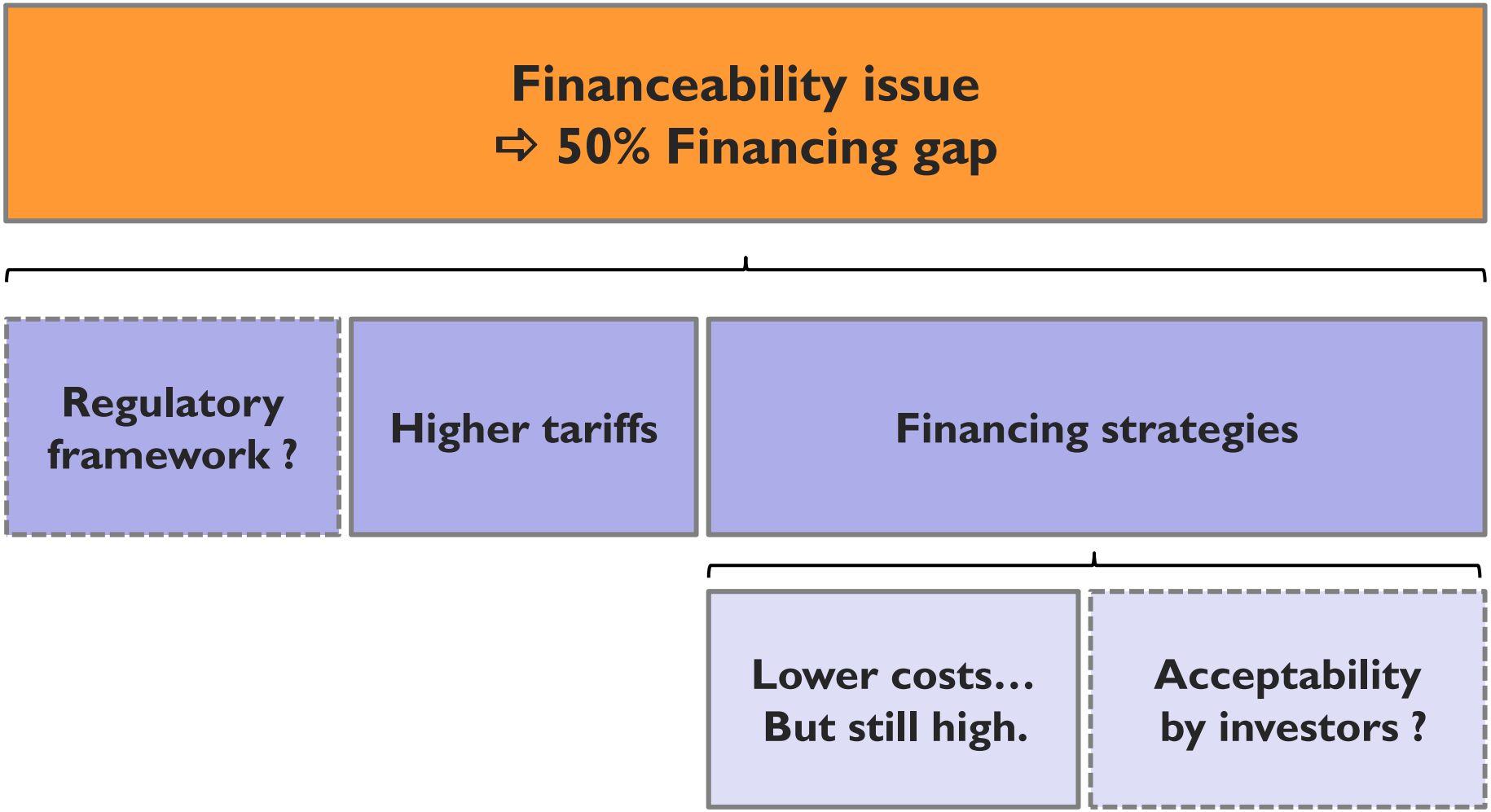
Shift to growth model: which tariffs to achieve 100% TYNDP?

- **Releasing constraints** on financial ratios vs. **Higher cost** for equity



- **Possible to achieve the whole investment program with lower impact on tariffs and a constant ROE (BUT the impact of lower dividends is unclear).**
- **Optimum reached for relatively high pay-out ratio.**
- **Tariffs will have to rise significantly anyway !**

Conclusion


Financeability issue
⇨ 50% Financing gap
Regulatory framework ?
Higher tariffs
Financing strategies
Lower costs…
But still high.
Acceptability by investors ?

Thank you !

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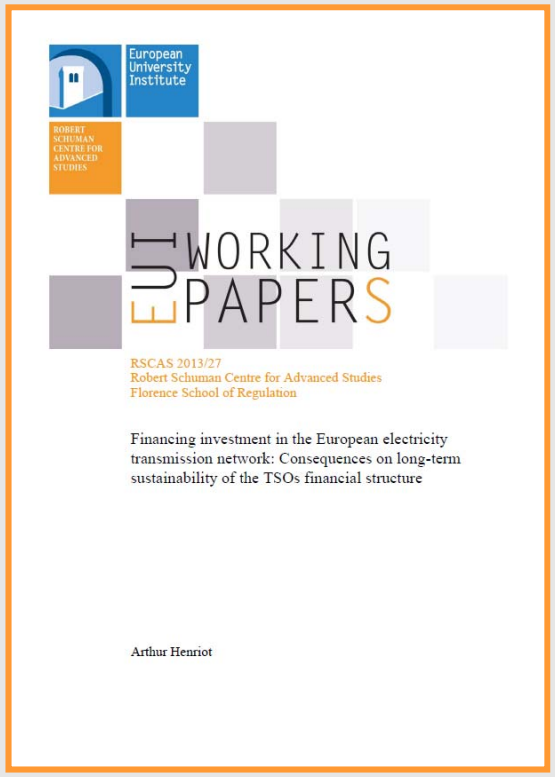
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ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES

EUI WORKING PAPERS

RSCAS 2013/27
Robert Schuman Centre for Advanced Studies
Florence School of Regulation

Financing investment in the European electricity transmission network: Consequences on long-term sustainability of the TSOs financial structure

Arthur Henriot


ISSN 1977-3919

European University Institute

POLICY brief

On the web: http://fsr.eui.eu

ISSUE 2013/03 • April 2013

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

Author: Arthur Henriot[1]

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.

Florence School of Regulation

The Florence School of Regulation (FSR) was founded in 2004 as a partnership between the Council of the European Energy Regulators (CEER) and the European University Institute (EUI), and it works closely with the European Commission. The Florence School of Regulation, dealing with the main network industries, has developed a strong core of general regulatory topics and concepts as well as inter-sectoral discussion of regulatory practices and policies.

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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

http://fsr.eui.eu

Back-up slides

Share of investments achievable in the 'Issue additional equity' scenario

		Equity injection as a share of total financing needs			
		0%	**15%**	**30%**	**50%**
Extended TYNDP	Share of investments achievable	47%	50%	54%	61%
	Equity injected by 2030 (Billion €)	0	7	16	32
	Average nominal post-tax ROE	7.2%	6.6%	5.9%	5.0%
EC Roadmap	Share of investments achievable	61%	66%	71%	81%
	Equity injected by 2030 (Billion €)	0	7	15	31
	Average nominal post-tax ROE	7.1%	6.3%	5.7%	4.7%

Back-up slides

Share of investments achievable in the 'shift to growth model' scenario

		Dividend Pay-out ratio		
		70%	**50%**	**30%**
Extended TYNDP	Share of investments achievable	47%	51%	54%
	Average nominal post-tax ROE	7.2%	6.4%	5.8%
	ROE received as dividends	5.0%	3.2%	1.7%
EC Roadmap	Share of investments achievable	61%	66%	71%
	Average nominal post-tax ROE	7.1%	6.3%	5.6%
	ROE received as dividends	5.0%	3.1%	1.7%

Back-up slides
Data

- **Most of the data from ENTSO-E**
  - **TYNDP 2012**
  - **ENTSO-E Memo 2010**
  - **ENTSO-E System adequacy retrospect 2011**

  ⇒ **Used as such**

- **Investment volumes for EU-27**
  - **EC Roadmap**
  - **IEA World Energy Outlook 2011**

  ⇒ **Multiplicative factor of 1.096 based on TYNDP 2012**

- **Data from the TSO annual reports**
  - **A few countries missing (Bulgaria, Greece, Bosnia, Luxembourg, FYROM, Cyprus)**

Back-up slides
Data (2)

Technical parameters

- Depreciation duration: 40 years *(TSO annual reports)*
- Remaining depreciation duration for existing assets: 20 years *(TSO annual reports)*
- Network length: 305 000km in 2012 / Growth factor of 1.90 M€/km *(TYNDP)*
- Network losses: 1.50 % *(ENTSO-E memo 2010)*
- OPEX: 0.014M€/km *(RTE Annual-report)*

Macro-economical parameters

- Electricity consumption: 3320 TWh in 2011 *(ENTSO-E system adequacy 2011)*
  Annual consumption growth: of 0.77% *(TYNDP)*
- Average electricity prices: 55.0 €/MWh
- Sector-specific inflation: HIPC+1.0% *(France historical data)*

Financial parameters

- Initial gearing: 58.9% *(TSO annual reports)*
- Initial Regulated Asset Base: 65,010 M€ *(TSO annual reports)*
- Corporate tax rate: 27% *(Own calculations based on KPMG)*
- Interest rate: 4.0%
- Equity injection: 0%
- Share of earnings retained: 30 %

Back-up slides
Sensitivity study

Sensitivity of the TSO financial profile to the main parameters		
No Impact	**Small impact**	**Significant impact**
• Network losses • Electricity consumption* • Electricity prices • Network-related OPEX	• Avoided renewal infrastructure costs • Corporate tax rate	• Depreciation duration* • Sectorial inflation* • Interest rate • Allowed Rate-of-return* • Equity injections • Dividends policy

Parameters with a significant impact on tariffs are indicated with a star (*)

- **The most significant parameters are macro-economical parameters that are out of the TSO control.**
- **The TSO business-model can also have a significant impact. However, this rough sensitivity analysis does not reflect the behaviour of investors. Change in the business-model would not occur without changes in other parameters (allowed rate-of return).**

Back-up slides

Financial ratios taken into consideration

MOODY'S METRICS	Weight		Aaa	Aa	A	Baa	Ba	B
Adjusted interest cover ratio (Higher than)	15%		6	4	2	1.4	1.1	
Gearing (Lower than)	15%		30%	45%	60%	75%	90%	
FFO/Debt (Higher than)	5%		30%	20%	12%	8%	4%	
RCF/CAPEX (Higher than)	5%		3.5	2.5	1.5	1	0.5	

- **Adjusted interest cover ratio:**

$$= \frac{EBIT}{Interest}$$

"Ability to pay interest"

- **Gearing:**

$$= \frac{Debt}{Debt + Equity}$$

"Loan to value ratio"

- **FFO/Debt:**

$$= \frac{EBIT + Depreciation - Interest}{Debt}$$

"Ability to cover future debt repayments"

- **RCF/CAPEX:**

$$= \frac{EBIT + Depreciation - Interest - Dividends}{Capex}$$

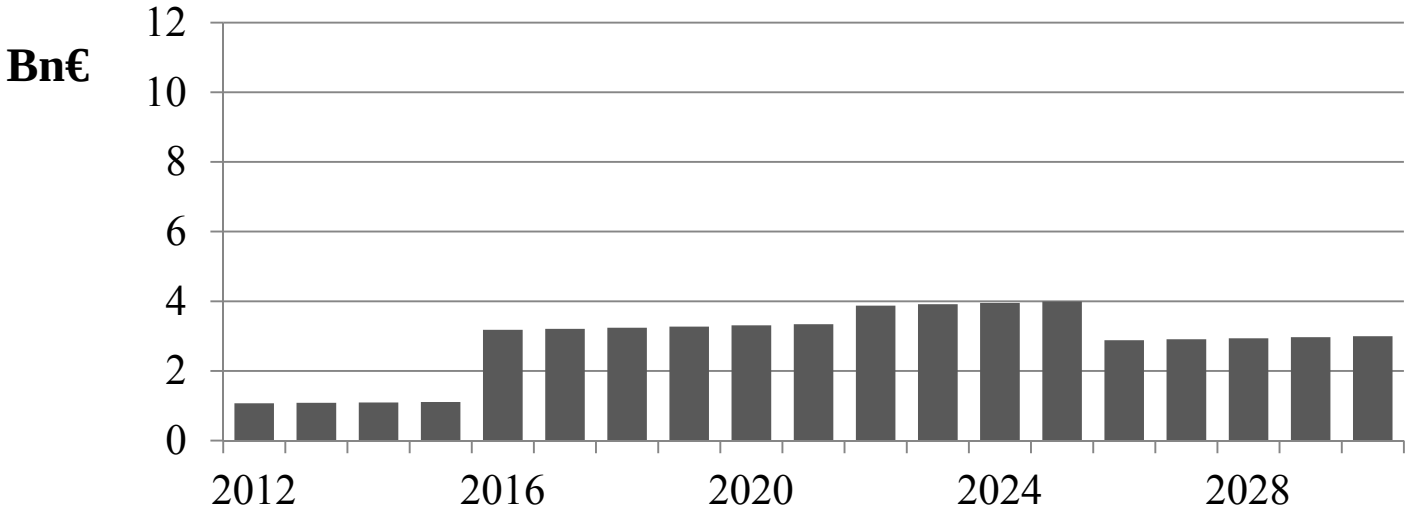
"Ability to fund investments internally"

Back-up slides
Investment scenarios

- **Infrastructure renewals (IEA WEO 2011)**
  - 2009-2015: 8 % of existing network to renew
  - 2016-2025: 21% of existing network to renew
  - 2026-2035: 15% of existing network to renew

  Total cost of €2012 76 billion for ENTSO-E over 2011-2035

- **8300 km renewals avoided over the period 2011-2020 thanks to new investments.**

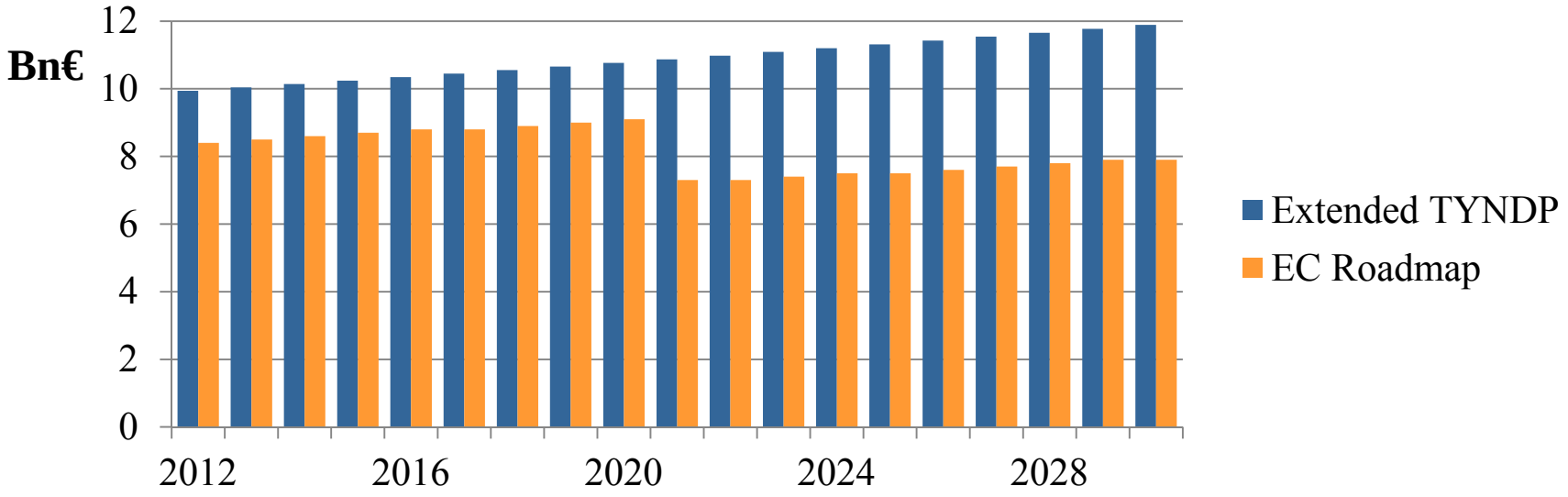


Annual costs for infrastructure renewals in the ENTSO-E area over the period 2012-2030 (€2012 Billion)

Back-up slides
Investment scenarios (2)

- **Scenario 1 for new investments: TYNDP extended**
  - €104 bn over 2012-2021
  - Similar annual effort until 2030 => Total €207 bn over 2012-2030

- **Scenario 2 for new investments: EC Roadmap**
  - €79 bn over 2012-2020 / €76 bn over 2021-2030
  - Total €155 bn over 2012-2030



Annual costs for new investments (€2012 billion)