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BUSINESS SCHOOL

NIEUWE MARKTMODELLEN VOOR STROOMVOORZIENING

MET ZON, THUISBATTERIJEN EN HAASJE-OVER

PROF LEONARDO MEEUS,

KVAB, 23 MEI 2017, BRUSSEL

De eindgebruiker centraal in de energietransitie

Ronnie Belmans
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Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten, 2016
Standpunten 44

4 Conclusies en aanbevelingen voor het regelgevende kader

In dit document bespraken we een aantal belangrijke trends in de energiesector. Verschillende scenario's werden onderzocht: de alleenstaande verbruiker, het appartementsgebouw, de woonwijk en de KMO-zone. Voor elk scenario stelden we voorop hoe het energiesysteem voor de kleine verbruiker er in de toekomst zou kunnen uitzien op basis van de huidige evoluties, en gaven we aan waar het regelgevende kader de energietransitie afremt of verhindert. Hieronder formuleren we de voornaamste conclusies die op regelgevend vlak verder onderzoek vergen.

- De regelgeving dient aangepast te worden aan de energietransitie. Ze moet omgevormd worden van een beperkende naar een proactieve benadering waarin de gebruiker centraal staat. Zo kan hij de gewenste energiediensten vanuit de markt transparant verkrijgen, zonder met de techniciteit van het systeem geconfronteerd te worden. De eindgebruiker die de energietransitie ondersteunt, moet hiervoor beloond worden.

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WINTER PACKAGE

2030 Energy Strategy

EU countries have agreed on a new 2030 Framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term 2050 greenhouse gas reductions target.

The strategy sends a strong signal to the market, encouraging private investment in new pipelines, electricity networks, and low-carbon technology. The targets are based on a thorough economic analysis that measures how to cost-effectively achieve decarbonisation by 2050.

The cost of meeting the targets does not substantially differ from the price we will need to pay in any case to replace our ageing energy system. The main financial effect of decarbonisation will be to shift our spending away from fuel sources and towards low-carbon technologies.

Targets for 2030

- a 40% cut in greenhouse gas emissions compared to 1990 levels
- at least a 27% share of renewable energy consumption
- at least 27% energy savings compared with the business-as-usual scenario.

Commission proposes 'new deal' for energy consumers, redesign of electricity market and revision of energy label for more clarity

Wednesday, 08 July 2015

Updated Wednesday, 15 July 2015

The package is an important step towards implementing the Energy Union strategy with a forward looking climate change policy, launched as one of the political priorities of the Juncker Commission in February 2015. Today's proposals give prominence to the "energy efficiency first" principle and put households and business consumers at the heart of the European energy market.

EU Commission Vice-President for Energy Union Maroš Šefčovič said: "In the Energy Union strategy, we committed to empowering European consumers, creating a single well-functioning energy market, putting energy efficiency first and becoming the number one in renewables. Today, five months after the adoption of the Energy Union strategy, this Summer Package shows our determination to decarbonise our economy and to give consumers a central role in Europe's energy transition. It marks not only a new deal for consumers, but a new deal for Europe´s entire energy system."

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30TH OF NOVEMBER, 2016

Thousands of pages (>9 legal texts)

NEW DEAL?

- Independent aggregators
- Local energy communities
- Renewable energy communities

- Smart metering
- Dynamic pricing

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DISTRIBUTION GRID TARIFF DESIGN (MET ZON EN THUISBATTERIJEN)

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Article 55~~6~~

Establishment of network codes

(k) rules regarding harmonised transmission ⇨ and distribution ⇦ tariff structures ⇨ and connection charges ⇦ including locational signals and inter-transmission system operator compensation rules; ~~and~~

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SECTION 2

NETWORK CHARGES AND CONGESTION INCOME

Article 16~~14~~

Charges for access to networks

9. By [*OP: please add specific date – th* …cy shall provide a recommendation addressed to regulatory authorities on the progressive convergence of transmission and distribution tariff methodologies. That recommendation shall address at least:

(a) the ratio of tariffs applied to producers and to consumers;

(b) the costs to be recovered by tariffs;

(c) time differentiated network tariffs;

(d) locational signals;

(e) the relationship between transmission and distribution tariffs, including principles relating to non-discrimination;

(f) methods to ensure transparency in the setting and structure of tariffs;

(g) groups of network users subject to tariffs, including tariff exemptions.

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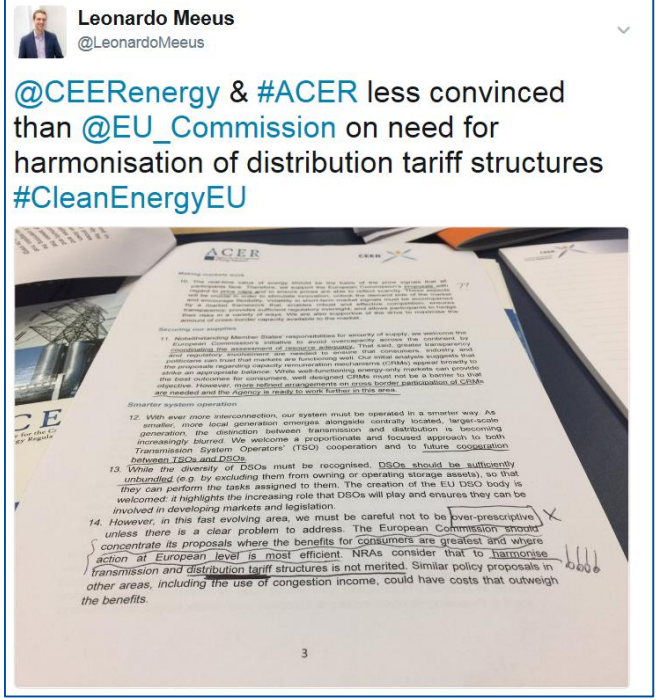
To illustrate on a concrete example, uncoordinated national policies concerning the principles for distribution tariffs may distort the internal market to an extent that distributed generation or energy storage services will be under very different incentives to participate in the market. With the uptake of new technologies and energy services increasingly traded across borders, EU action has a significant value in ensuring a level playing field and more efficient market outcomes for all parties involved.

REACTIONS



ACER
Agency for the Cooperation of Energy Regulators

CEER

European Energy Regulators' Overview Paper

Initial Reactions to the European Commission's proposals on Clean Energy

EDSO
for smart grids

European Distribution System Operators for Smart Grids

EDSO position paper on the Clean Energy Package

March 2017

DISTRIBUTION GRID TARIFF DESIGN

- Signalling the cost of grid expansion
  - Integrating distributed energy resources
  - How to put a price on grid connection, access, and congestion?
- Recovering legacy costs
  - Taxes and levies, sunk grid costs
  - How to minimize the distortions?
- Other considerations
  - Equity, non-discrimination, energy efficiency, simplicity

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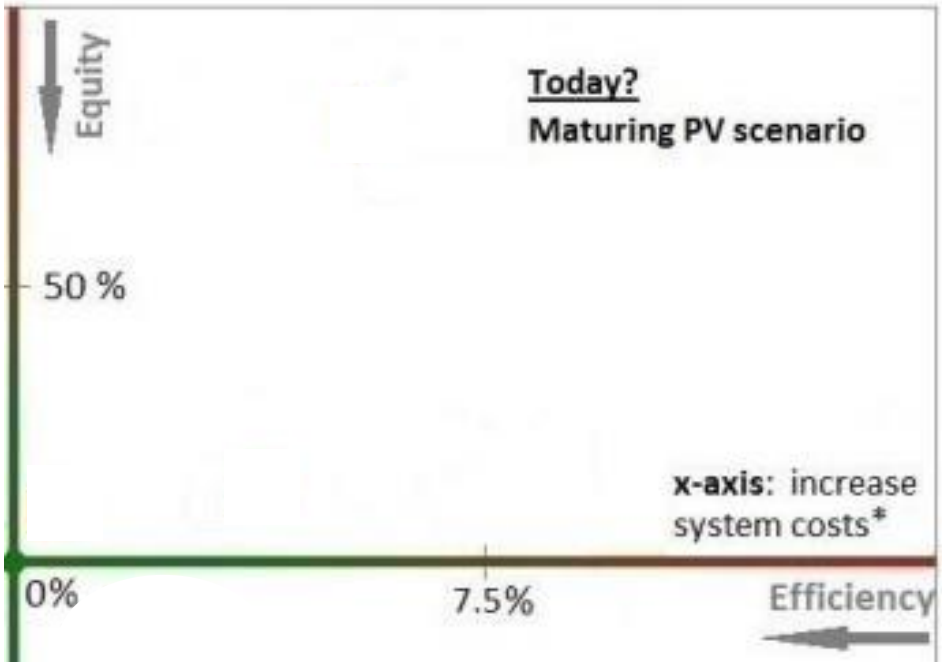
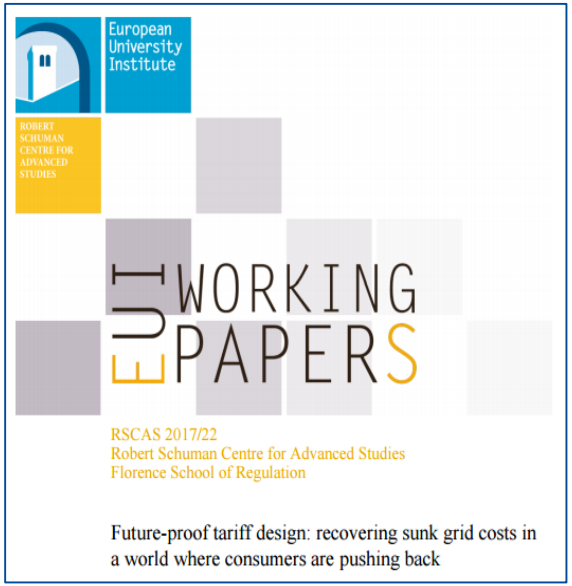
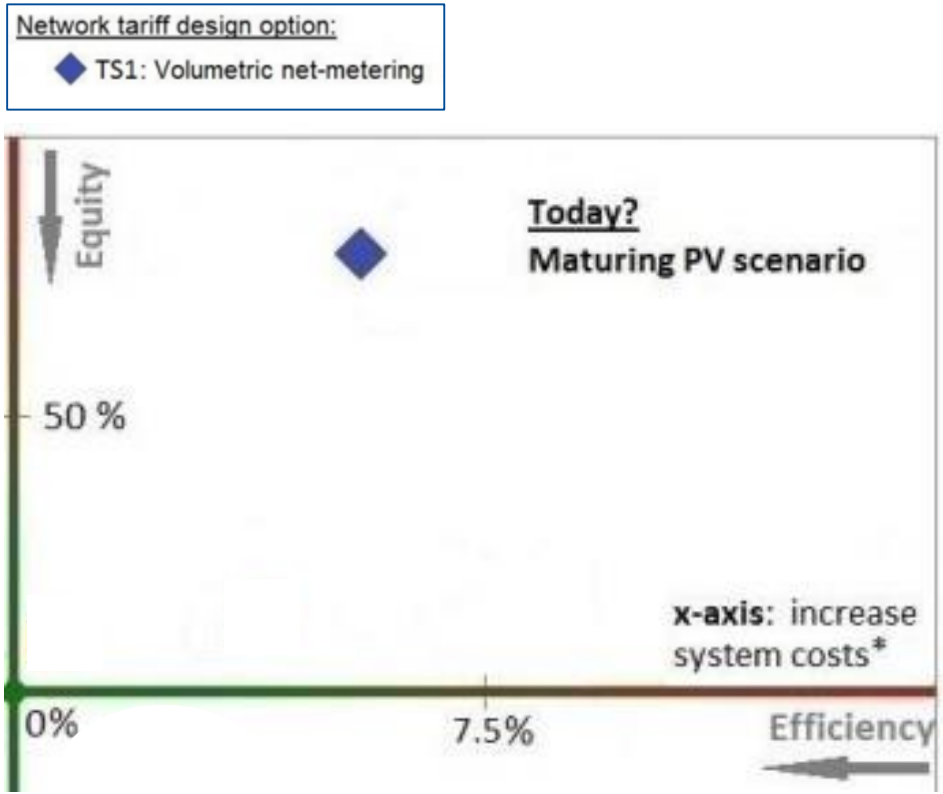
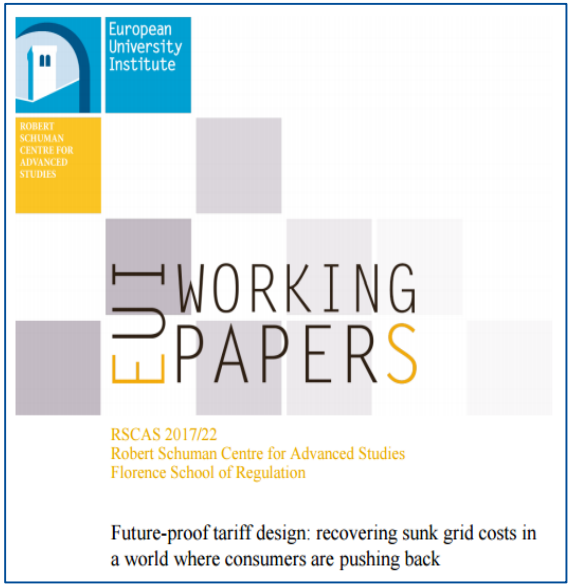
RECOVERING SUNK GRID COSTS IN A WORLD WHERE CONSUMERS ARE PUSHING BACK





RECOVERING SUNK GRID COSTS IN A WORLD WHERE CONSUMERS ARE PUSHING BACK





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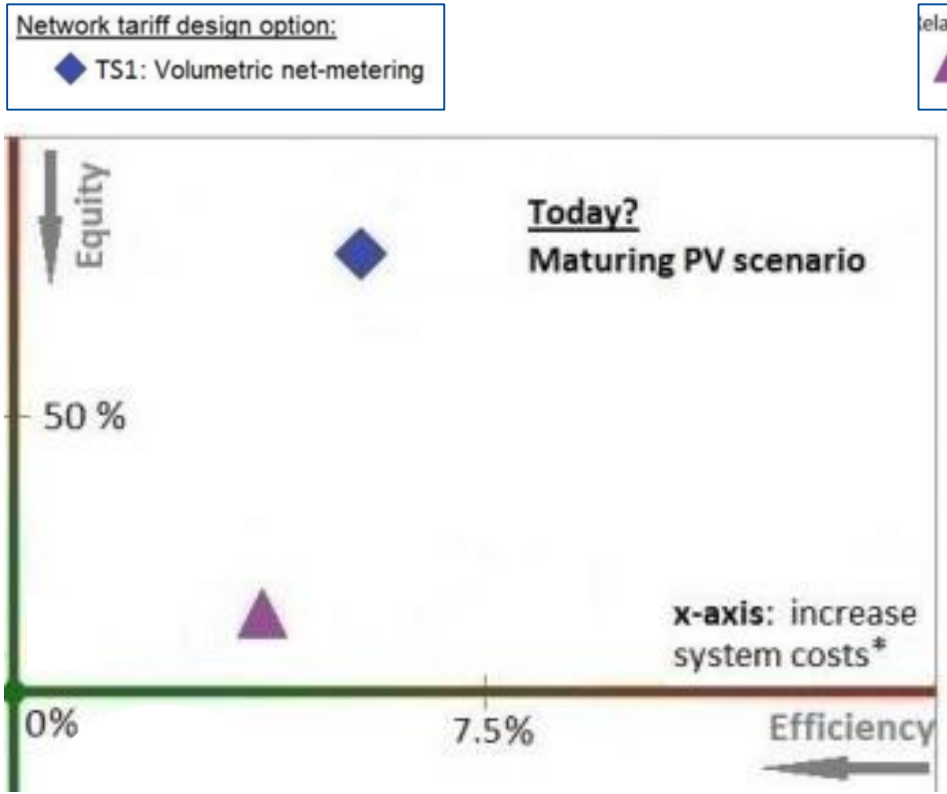

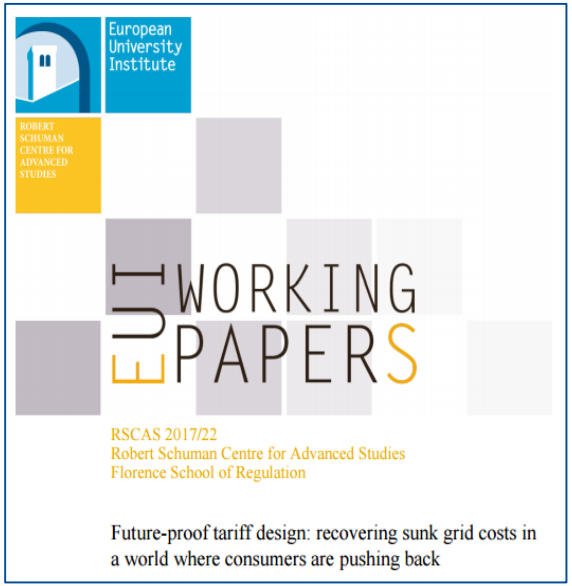

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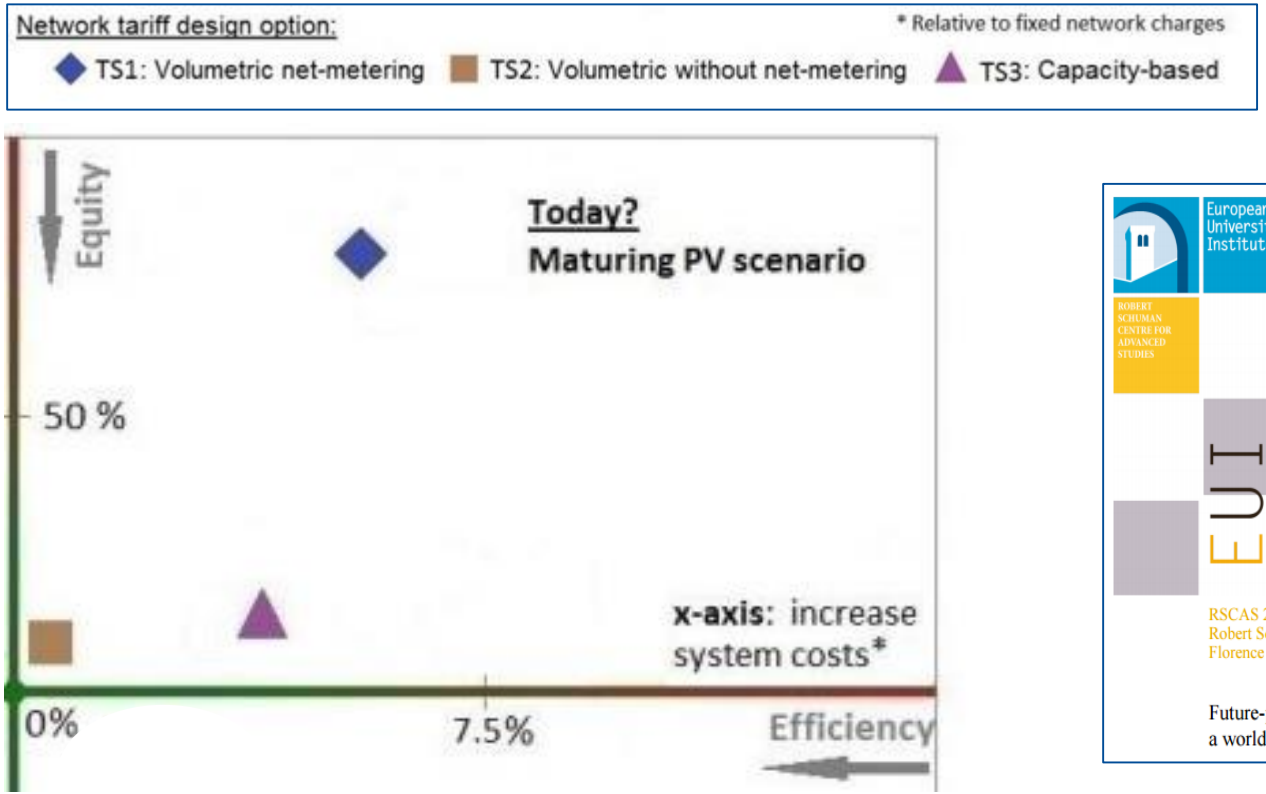

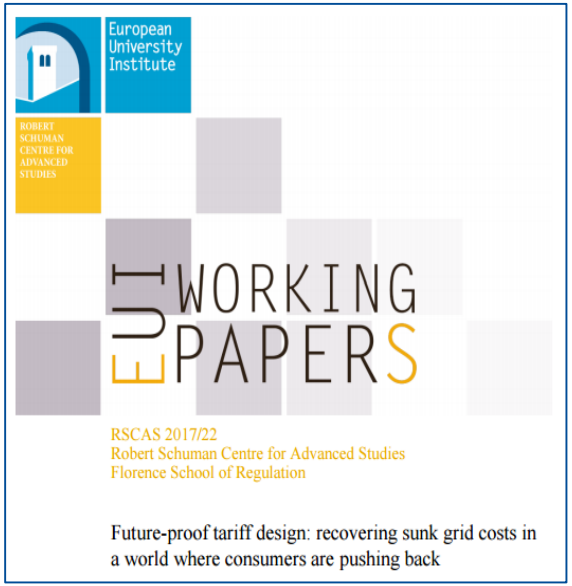

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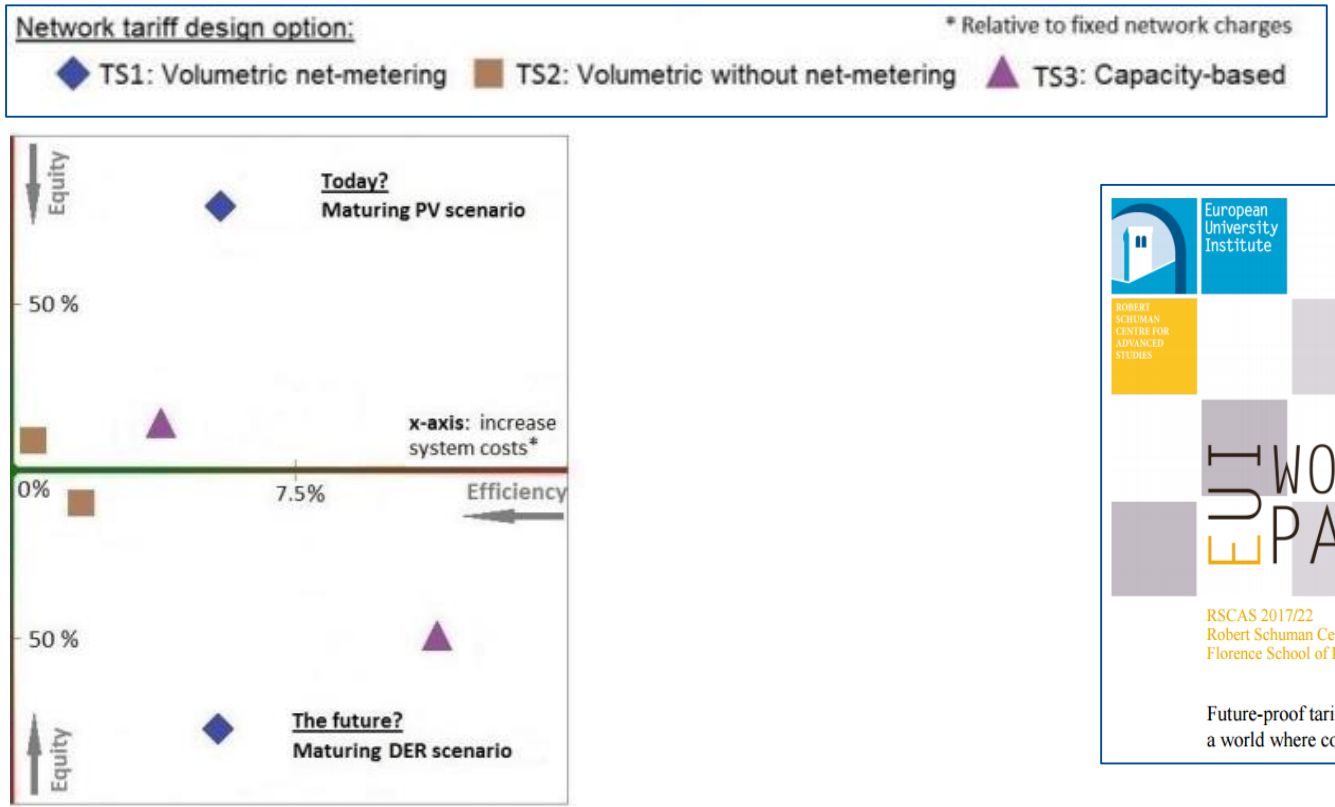

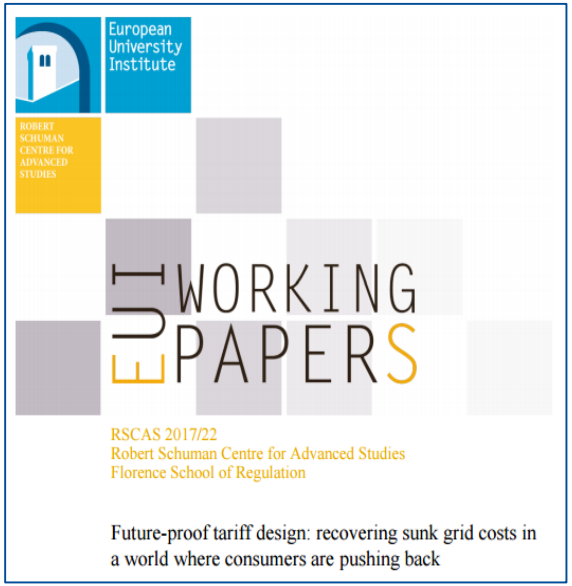

LOCAL GRID CONGESTION MANAGEMENT

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Article 32

Tasks of distribution system operators in the use of flexibility

1. Member States shall provide the necessary regulatory framework to allow and incentivise distribution system operators to procure services in order to improve efficiencies in the operation and development of the distribution system, including local congestion management. In particular, regulatory frameworks shall enable distribution system operators to procure services from resources such as distributed generation, demand response or storage and consider energy efficiency measures, which may supplant the need to upgrade or replace electricity capacity and which support the efficient and secure operation of the distribution system. Distribution system operators shall procure these services according to transparent, non-discriminatory and market based procedures.

Distribution system operators shall define standardised market products for the services procured ensuring effective participation of all market participants including renewable energy sources, demand response, and aggregators. Distribution system operators shall exchange all necessary information and coordinate with transmission system operators in order to ensure the optimal utilisation of resources, ensure the secure and efficient operation of the system and facilitate market development.

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Article 53

Cooperation between distribution system operators and transmission system operators

1. Distribution system operators shall cooperate with transmission system operators in planning and operating their networks. In particular, transmission and distribution system operators shall exchange all necessary information and data regarding, the performance of generation assets and demand side response, the daily operation of their networks and the long-term planning of network investments, with the view to ensure the cost-efficient development and operation and the secure and reliable operation of their networks.

2. Transmission and distribution system operators shall cooperate in order to achieve coordinated access to resources such as distributed generation, energy storage or demand response that may support particular needs of both the distribution system and the transmission system.

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WINTER PACKAGE FLEXIBILITY PROCUREMENT

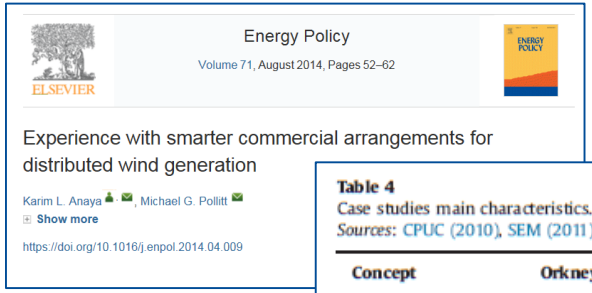
FIT AND FORGET

Table 5: Cumulative investment needs in transmission (including interconnectors) and distribution

Source (Unit)	Scenarios	Investment	2000-2013	2011-2020	2021-2030	2031-2040	2041-2050
OECD/IEA 2014 (billion USD'12)	NPS	Transmission	56	61	65	60*	NA
		Distribution	364	246	230	230*	NA
	450**	Transmission	56	70	70	70*	NA
		Distribution	364	226	226	226*	NA
EC 2011 (billion EUR'05)	CPI	Transmission	NA	47.1	49.6	64.8	66.6
		Distribution	NA	245	239.3	317.6	325.9
	High EE	Transmission	NA	49	63.1	80.3	80.1
		Distribution	NA	256.3	289.1	408.4	291.8
	DST	Transmission	NA	52.8	70.2	88	86.8
		Distribution	NA	284.2	345.9	454.3	329.8
	High RES	Transmission	NA	52.8	95.5	137.8	134.4
		Distribution	NA	283.5	440	619.8	431.5
	Delayed CCS	Transmission	NA	52.7	71	88.6	87.6
		Distribution	NA	283.4	349.4	445.1	339.6
	Low nuclear	Transmission	NA	52.9	73.8	95.2	94.8
		Distribution	NA	286.4	350.8	472.5	366.5
ECF 2012 (billion EUR)	On track	Transmission	NA	46	68	NA	NA

Note: *Assuming same annual average for 2036-2040 as for 2031-2035; **Assuming uniform distribution of the investment over time.

SMARTER CONNECTION



Energy Policy

Volume 71, August 2014, Pages 52–62

Experience with smarter commercial arrangements for distributed wind generation

Karim L. Anaya, Michael G. Pollitt

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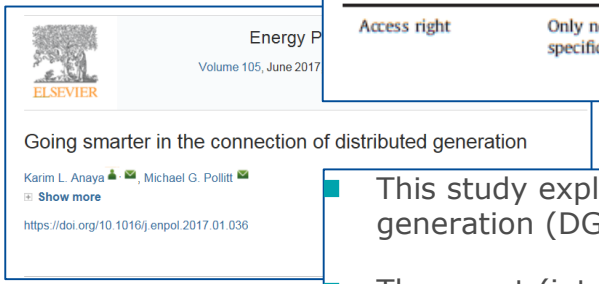
https://doi.org/10.1016/j.enpol.2014.04.009



Energy P

Volume 105, June 2017

Going smarter in the connection of distributed generation

Karim L. Anaya, Michael G. Pollitt

Show more

https://doi.org/10.1016/j.enpol.2017.01.036

Table 4
Case studies main characteristics.
Sources: CPUC (2010), SEM (2011), SCE (2012b), SSEPD (2012c), National Grid (2013) and personal communication with Lewis Dale and Martin Moral from National Grid.

Concept	Orkney ANM (GB)	Connect and Manage (GB)	Wind curtailment in tie-break situations (ROI/NI)
Access right	Only non-firm (with ANM specifications)	Firm access. Second class access rights (non-firm) is also an option	Depending on technical conditions, access varies from non-firm to full firm access (FAQ from 0% to 100%)

- This study explores and quantifies the benefits of connecting more distributed generation (DG) with and without the use of smart connections in Great Britain.
- The smart (interruptible) connection option is the preferred option across all the scenarios (higher NPV/MW).

NODAL DISTRIBUTION GRID PRICING

"Neither existing nor emerging centralized market clearing approaches can be extended to derive the requisite **T&D locational marginal prices** (T&DLMPs) with acceptable tractability, scalability, and communication requirements" (Caramanis et alii, Procedings of IEEE, 2016)"

OFFGRID (HAASJE-OVER)

1.2 billion people worldwide are without access to electricity,
of which 0.6 billion in Africa (= 2/3 of African population)

Members

Alliance for Rural Electrification
Shining a Light for Progress
2006 2016 10 YEARS

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SEVERIN BORENSTEIN

- "Around the world economies have gotten to be advanced by taking advantage of **economies of scale**"
- "I don't think my house should be **energy independent** any more than it should be food independent or clothing independent."

ENERGY INSTITUTE AT HAAS

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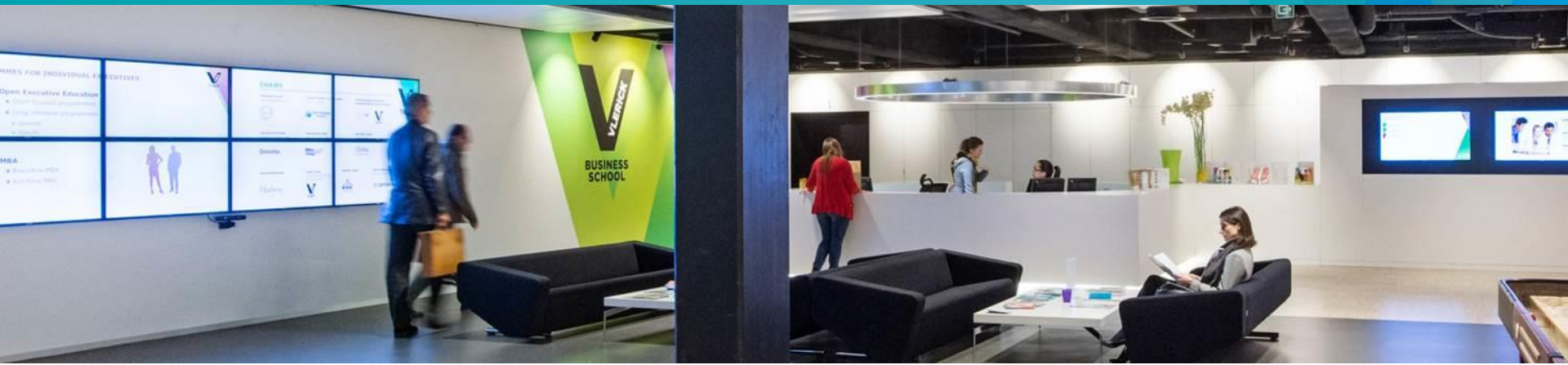

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