

THEME 1: How to design an energy market for a greater variety of stakeholders and roles?

POLICY MESSAGE	MARKET CONDITIONS AFFILIATION	
	Centralized (C) Exchange-based (E) Local (L) Regional integrated (R) Other (O)	Government (G) Academia/Res.Inst (A) Private Supplier (PS) Private Other (PO) Stakeholder org. (S) NGO (N) Other (O)
The challenge is to make the <u>prosumer part of it</u> , without engaging him/her "too much". The necessity is to make pedagogy in order for him to understand the global frame of energy and - over all - its invoice. As we are entering more and more in a <u>flexibility market</u> , we need to follow the different inputs of players. The aggregators could be the players (actors) who push the whole system, acting as people gathering the info and giving a price signal, thanks to the data they have.	L	O - Smart Grids national Platform
1. Unleash flexibility in generation and demand by amplifying spot price variations (incl. grid congestion) using e.g. dynamic electricity taxes, i.e. a gain (??) factor on spot prices. 2. Open Europe for free electricity trade - including German borders	C, E, L, R	Government
Having a favourable environment - this includes the right policy and regulatory framework being in place. We work with market logic, we need to see that investments we make in moving toward a fossil free future will pay off. Nissan is in a unique position to offer governments and cities sustainable solutions. Our expertise in EVs, V2G sets us apart from other vehicle manufacturers and across Europe. Nissan is now a distributor in the energy market.	L, R	PS, PO
* There is a need to consider integration of markets as we move towards a more integrated energy system (i.e. gas/heat, electricity, transport) * In order to value flexibility, we need dynamic pricing which can be done through: 1. dynamic taxation (taxes that reflect spot pricing) 2. Aggregation 3. Grid fees * As markets become more integrated, regulations will need to take this into account and consider interactions (e.g. Germany exporting subsidized energy)	All sectors	A
* Phase out all support (?) schemes that do not allow the market price to be sent (?) (FiT, Prefer FiP, certificates...) * VRE-friendly, grid tariff and electricity taxes (time-based) * Remove double taxes etc associated with battery use	O (not specified)	A
I believe one should avoid the risk of pushing systems that have no market potential * Looking at Demand Response, it is very important to analyze in which way all stakeholders are benefitting! * If consumers do not have any awareness & interest in flexibility, even the best technology will not result in any flexibility * If distribution companies are not interested in flexibility, even the best technology will remain unused * It is critical to design systems so that every stakeholder 1. is capable of, and 2. has incentive to participate	L	A
* To define and possibly ringfence the DSO role * To make "real" use of the blockchain technology * The role of the customer --> not just consuming but also providing services to the network - these services should be rewarded	L	G
Efficient price signals on the local grid level that reflects bottlenecks. Network tariffs may be a blunt tool. DSOs have to organize additional local flexibility markets.	L	G
Tease apart what we mean by "market". Grid flexibility is a different concept from transactive energy market. For the latter to incentivise prosumer/aggregator, you need a price signal !!!	C, E, L	G
DSOs to accept that the users of the grid are not only customers in the sense of paying for energy logistics - DSOs brings energy for the producer and supplier to the consumer - but that they can also be providing flexibility services: provide storage capacity to provide stability and to avoid congestion on the HV level.	E	A

POLICY MESSAGE

Centralized (C)
Exchange-based (E)
Local (L)
Regional integrated (R)
Other (O)

Government (G)
Academia/Res.Inst (A)
Private Supplier (PS)
Private Other (PO)
Stakeholder org. (S)
NGO (N)
Other (O)

<p>* Clarification of ownership of storage</p> <p>* Who should be "responsible" to design the market, or will the "invisible hand" work better in this context?</p>	E	S
<p>* Retail pricing mechanisms</p> <p>* Third-party access to transmission&distribution networks</p> <p>The pricing schemes reflect system cost, reliability requirements and customer-side benefits</p> <p>Third-party access will set up minimum requirements and give the space for the market competition.</p>	C, E, R	A
<p>Having a flexible regulatory and policy framework that can accommodate changes in technology, business models and market conditions</p>	C, E	A
<p>Change needs to start here and now.</p> <p>Different markets have different challenges. A common vision would however be beneficial. Policy makers are responsible for the vision. Regulators and others (big, small, companies, etc) may advocate for different solutions/goals. Academia and regulators are independent which make them trustworthy.</p> <p>Sandbox - important tool. A lot of interesting pilots take place as we speak.</p> <p>Gather information is extremely important to be able to share examples of "success".</p> <p>We need to rethink the "one fits all" model. I ask myself if the current implementation of EU regulation (centralized) will turn out to be an obstacle for deployment of new technology and an enhanced market design.</p>	E, L	G
<p>Conflict between the price signals sent by retail prices and the regional/local situation in the grid. The prices are not taking local conditions into account and the DSOs that have the knowledge about the local conditions have barriers to provide customers with flexible and geographically differentiated agreements to use the resources and infrastructure more efficiently.</p>	E, L	O (state owned company, DSO)
<p>The incentives given by regulation to the DSOs are in countries like Sweden currently not at all "promoting smart solutions", such as technical innovations in metering, data management and optimization of resources. Regulations must be changed to force the DSOs to either stimulate others or start themselves providing flexibility services at local level, i.e. by storage or smart home applications, in combination with aggregator services.</p>	L	PO
<p>Incentivise DSOs and TSOs to ensure an overall efficient system, both in how to develop the system and for operating it.</p> <p>We need to both integrate markets across grid levels to ensure overall efficiency and develop local markets and provide incentives for local circumstances.</p>	C, E, L	O (TSO)
<p>We need to design market rules that acknowledge that we will probably have both an exchange-based market and peer-to-peer trading. This also impacts the networks. The local communities need different kinds of solutions (pricing models) than customers that do not participate in peer-to-peer. Regardless of the differences in eco systems we need transparency and fairness as guiding principles.</p>	E, L	G
<p>System interaction:</p> <p>* local/centralized market/flexibility</p> <p>* Incentive for behavioural change. Research is missing on behavioural economics, other incentives.</p> <p>* What is driving change - price? Time? Location? Our (??) having local pricing</p> <p>* Different ability to engage. How to manage this connected to price/affordability</p> <p>* Range of services</p> <p>* Real-time pricing</p>	not specified	G
<p>* The ancillary services markets must be opened up to new actors and contributions, the criteria are often biased.</p> <p>* Regulation needs to allow for and regulate new roles on the market</p> <p>* There is a big challenge to get grid owners to apply/implement new strategies.</p> <p>How can actual implementation after test beds be promoted (both by regulation and market design)?</p>	R	N

POLICY MESSAGE	MARKET CONDITIONS AFFILIATION	
	Centralized (C) Exchange-based (E) Local (L) Regional integrated (R) Other (O)	Government (G) Academia/Res.Inst (A) Private Supplier (PS) Private Other (PO) Stakeholder org. (S) NGO (N) Other (O)
Identifying the value elements such as security of supply (which is "too" important now), frequency regulation, the energy itself. Once identified, the different value elements should be priced depending on real demand in sandbox environments where everything is allowed, incl. blackouts. That will lead to a possible <u>market model</u> , depending on local factors. Such market models should be then studied and classified.	L, R	PO
In some (many?) electricity markets grid services provided by traditional plants are not being compensated, impacting the economic viability of those assets. Traditional thermal plants, such as nuclear (which is a non-emitting resource) provide substantial resilience to the grid, but are not being compensated.	C, L, R	A
Define different types of services which prosumers may provide and sell at the market to lift the amount of incentives for all market players	L, R	A
Diversification related to e.g. quality in reliability in power supply. Different customers have different needs and willingness to pay. Also in quality of services and flexibility (grid services, frequency control, etc.) should be allowed on different levels. "Less strict rules and levels and more diversification" "Standard on what flexibility is."	E	A
Having the regulatory sandbox approach to be able to open up for totally new aggregators that don't even know that they are part of the system is very important and also interconnecting those sandboxes. ??... Longterm financed programs are also important - "light-house projects"	E, L, R	PS, PO

THEME 2: How to achieve energy system integration and interaction?

POLICY MESSAGE	MARKET CONDITIONS	AFFILIATION
	Centralized (C) Exchange-based (E) Local (L) Regional integrated (R) Other (O)	Government (G) Academia/Res.Inst (A) Private Supplier (PS) Private Other (PO) Stakeholder org. (S) NGO (N) Other (O)
Again you need to have a vision. Market-based regulation is preferred. Price signals is an important tool to steer integration and new infrastructure investments. I tend to think that competition is an important tool to promote cost reflective solutions.	E, R	G
* Need for an integrated long-term strategic vision for integrated market * Communication with customer. At the end of the day, the society and customer should benefit.	E	S
Electrification (Evs, heat pumps) offer potential to overcome barriers to crosssectoral energy integration, but can create new planning and operational challenges in power sector. How to a design market that doesn't pick winners and losers?	C, E	A
* Need to ensure proposed changes are directly tied to achieving a benefit * Need to ensure solutions proposed are not too complex * Approach needed to incentivise: 1. reduction in losses, 2. not building, more infrastructure * How to incentivise investment where benefits are shared among multiple parties	C	A
Opportunity: review and revise incentive part in network regulation --> provide strong and the right incentives for network efficiency Coordination between network companies and regions, producers, other actors in order to get a better basis for planning.	E	G
* Pricing of CO2, true social cost should be reflected * Lack of information exchange between grid operators and producers on where the most suitable connection points should be located * More efficient use of the distribution grid through metering, monitoring and analyzing data. (Only 2% of all data collected is analyzed)	L	O (state-owned DSO)
DSOs have poor observability in the capillarres Better coordination with municipalities and other actors	E	G
Barriers: * DSOs have no incentive to participate. Regulation is addressing losses and subscriptions to grid level * Integration with interconnectors * Capacity calculation methods * Market that better reflect bottlenecks * Analysis of effect of distributed technologies such as blockchain. Will there e.g. be a day ahead market, centralized energy hub, etc. * Price incentive, cost/benefit all the way to the user, top-down.	not specified	G

- Centralized (C)
 - Exchange-based (E)
 - Local (L)
 - Regional integrated (R)
 - Other (O)
- Government (G)
 - Academia/Res.Inst (A)
 - Private Supplier (PS)
 - Private Other (PO)
 - Stakeholder org. (S)
 - NGO (N)
 - Other (O)

POLICY MESSAGE

* Interconnectors between different jurisdictions can contribute greatly to the possibility to delay and deal with challenges of RES.

* Challenges are to do the right analysis where they should be ..??.. Cost ...??.. Issues

E, R

G

* There are also challenges in regard to utilize the capacity on the interconnectors in the most efficient way. Bidding zone configuration and capacity calculation methodology can contribute greatly in this respect

* Identify, quantify and allocate the benefits of the energy system integration

* Scope the energy system boundary (district heating, cooling, electriciy...)

C, E, L

A

We mustn't forget about consumers, especially the importance of accelerting renewable energy and its impact on energy integration. It is also important to increase awareness of renewable integration for flexibility of energy systems.

C

O

* Challenge: to make different types of energy useful for the whole system and there are joint market frame, energy integration (electricity, gas, heat)

* The idea is to be more energy "sober", using the complementarities between different types of energy

--> Set a price (+/- 30€) on CO2

R

O (national smart grids platform, France)

* Focus on integration of power systems to larger areas. I.e. interconnect larger geographic areas. Force Germany to be more integrated in the European power system.

* Integrate electricitiesystem more with other energy systems like power <--> heat, power <--> gas, etc

R

G

Nissan does not see vehicles as modes of transport but as an integrated part of the energy system. The ambition to increase the numbers of Evs is absolutely right and we have a great new LEAF on the market :-). But as the EV penetration rate increases there are big challenges for the grid and Nissan is uniquely laced to offer the solution. Game changing solution with energy storage and V2G.

L, R

PS, PO

* VRE-based flex services (system services, simple balancing...) based on relevant time steps etc. and that are standardized across countries and markets to facilitate exchange.

* Find a value for flexibility. Based on what; who implements; what financial channels ==> ??

Not specified

A

* Moving towards a global grid could be a solution (but one that is not without challenges).

* Grid integration should consider integration of energy systems (e.g. power to gas)

* Integration solutions should be based oon cost-benefit analysis to determine the most appropriate solutions.

All markets

A

Challenge: agreement on the monetary costs and benefits of the different components in a system. A multivariate analysis/optimization on a local, regional or global level can only be one if every variable (e.g. real-time monitoring, flexibility, carbon footprint) has a "price-tag" in the same "currency".

All markets

PO

MARKET CONDITIONS AFFILIATION

- Centralized (C)
 - Exchange-based (E)
 - Local (L)
 - Regional integrated (R)
 - Other (O)
- Government (G)
 - Academia/Res.Inst (A)
 - Private Supplier (PS)
 - Private Other (PO)
 - Stakeholder org. (S)
 - NGO (N)
 - Other (O)

POLICY MESSAGE

Successful, efficient and cost-effective integration of energy technologies on the grid will require definition of the desirable aspects/performance characteristics (e.g. cost, reliability, emissions, dispatchability, resilience). These "assets" must then be monetized (?) to enable multi-variable system optimization that also takes into account energy system and balancing area constraints. This approach will ensure a focus on performance assets and then determining which generation on sources (or combination) can best meet the needs, without pre-determining what assets should be on the grid.

Not specified

A

Identification of present and future limitations in the system which are impacting the capacities and security of the system, to provide correct incentives for integration at the right level and location within the power system, to provide the holistic and global solutions to best support a sustainable future.

Not specified

A

The introduction of local markets emphasizes the need to ensure an efficient use of resources on a higher system level (national, international...).

The interfaces between local markets and overlaying markets should be carefully designed to avoid incentives for sub-optimization. This concerns several market layers, spanning from local systems to international/global systems.

E, L, R

A

Variation strategies (to integrate more RES) are complementary: you can't say batteries are best. The best is to use strategies with both storage, DSM, grid-flexibility & generation.

To integrate RES cost effectively you need many flexibility resources. What incentives does the market design give today. Maybe we need different markets and policy to drive the development of all those complementing strategies.

--> GRID - develop regulation

--> Markets - inertia, flexibility, reactive power, local flexibility (<-- local grid company)

C, L, R

N

THEME 3: What are the key elements in market design to accelerate deployment?

POLICY MESSAGE	MARKET CONDITIONS	AFFILIATION
	Centralized (C) Exchange-based (E) Local (L) Regional integrated (R) Other (O)	Government (G) Academia/Res.Inst (A) Private Supplier (PS) Private Other (PO) Stakeholder org. (S) NGO (N) Other (O)
Starting from the customer: scaling up small solutions in for example each house (fridge for flexibility) --> market incentive is not large (not much money for fridge) -> how do we stimulate them? Compared to: 20% of the households having smart solutions, less costs and the rest of the end-users having to share (?) the (increased) cost for the grid. --> protect weaker end-users from that. Current pricing may not lead to the most sustainable solution in the long term --> need for a <u>stable</u> market.	Not specified	A
* Find incentives which are correct for each specific region/country to involve customers and other plausible market participants to behave in a way which supports the system from a broad and local perspective. * Global visions need to become the visions also at local levels. * Utilize a large number of small appliances + provide services at an aggregated level.	All markets	A
* It would be good to conduct a testbed or pilot project with regulatory sandboxes, which might provide more various options/incentives to customers with different aspects. Guess it would also increase customer awareness and active participation. * Knowledge exchange in a variety of regulatory sandboxes from different countries might help find best practices and benchmarking models.	C	O
Dynamic grid tariffs and taxes Implement market-based incentives to end consumers to invest in flexible solutions (e.g. heat pumps) via e.g. white certificate scheme	Not specified	A
There are many incentives needed: * Regulation - make DSO/TSO consider smart solutions first (lines second) * Market - price signals for flex: tariffs; tax; local pricing area; inertia; grid services * Policy - accelerate deployment by support schemes for DR/flexibility	C, L, R	N
* Implementing regulatory sandboxes * Remove any possible incentive distortions in the regulation --> strengthen incentive regulations * Ensure price signals are right and come through	C, E	G
* When considering market design, need to first reflect the overall market structure (i.e. vertically integrated vs. deregulated) * Developed, deregulated markets may be able to learn from technology leapfrogging in centralized markets. * It is important to think through system transitions, i.e. what happens when microgrids are connected to the grid?	All markets	A
We need to have a more evidence-based approach to what changes we need in market design in order to accelerate deployment. Regulatory sandboxes is one way for getting that evidence.	E	G
Opportunity: Try to bundle benefits, so that the consumer has more incentives to try out new technologies, e.g. an investment into a charging station for EV by a private individual gives a discount on solar+battery or a discount on public transportation.	E, L	PO
The challenge with this is the lack of transparency for the consumer. Perhaps designing different "bundling levels" is an approach: "EV + public transportation ? X SEK of tax benefit" or "EV + public transportation + heat pump = 1,5 X SEK		

MARKET CONDITIONS AFFILIATION

Centralized (C)
 Exchange-based (E)
 Local (L)
 Regional integrated (R)
 Other (O)

Government (G)
 Academia/Res.Inst (A)
 Private Supplier (PS)
 Private Other (PO)
 Stakeholder org. (S)
 NGO (N)
 Other (O)

POLICY MESSAGE

<p>DSO:s make investment decisions with life times of 40-50 years. Hard to estimate the value of different options. Measures for <u>risk mitigation</u> are important for DSOs to chose "non-traditional" options which (added) costs have an uncertain value. So, instruments for risk management and mitigation targeting DSOs could facilitate deployment.</p>	Not specified	A
<p>* Cost neutrality in network tariffs * Test new models in small scale first * Cost-benefit analysis is important * Synchronized roll-out of technology in the same markets, eg. the Nordic power market.</p>	Not specified	G
<p>We need stable grids and flexible regulations that enable new technologies. Upgrading infrastructure must allow bi-directional changing and re-selling energy to the grid. Grid operations should enable other actors to trade on the energy market. Government that dare to be the forerunners: Nissan watch globally for markets where the grid is smart enough to constitute business opportunities beyond vehicles, like V2G, e.g. Fredriksberg in Copenhagen is already up and running (1st fully commercial V2G hub in the world).</p>	L, R	PS, PO
<p>* Local markets for flexibility * CAPEX-bias on grid investments * Tariffs should be more cost reflective and reflect local conditions.</p>	L	O (State-owned DSO)
<p>Uncertainty and flexibility</p>	C, E, R	A
<p>* Flexibility --> D/R, storage, that can help to build the market design * Capacity market can help * Dynamic pricing for the consumer</p>	R	O (smart grid national platform)
<p>* Benchmark DSO * Scale-up flex/DSM * Market design for flexibility * Include cross energy solution, e.. heating and cooling * Stimulate price and service level DSO * Stimulate asset owner invest in smart technology * Sandbox test regulatory issues, business models, etc.</p>	Not specified	G
<p>Defining a roadmap toward adoptive flexible market design</p>	C, E	A