Market reform fundamentals

Criterios e implementación de cambios estructurales en mercados energéticos

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We are under a new wave of reform needs

Large transformations underway: new reforms will be very important!

1990s: "First wave" Wholesale markets

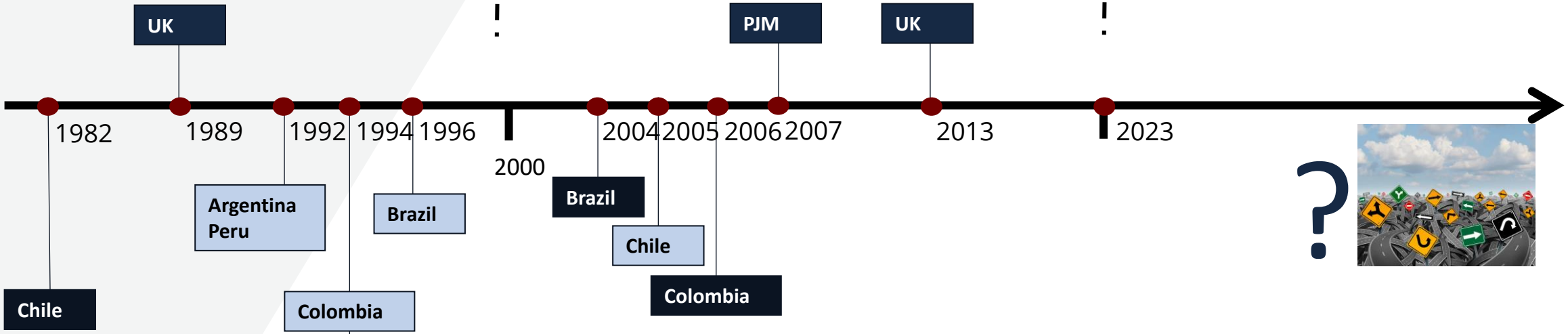
- Search for foreign capital investments
- Wholesale market competition
- Electricity market reforms

2000s: "Second wave" Reliability markets

- First major market fixes
- Reliability products to ensuring supply-demand equilibrium
- Renewables "birth"

2020s: "Third wave"? Energy transition

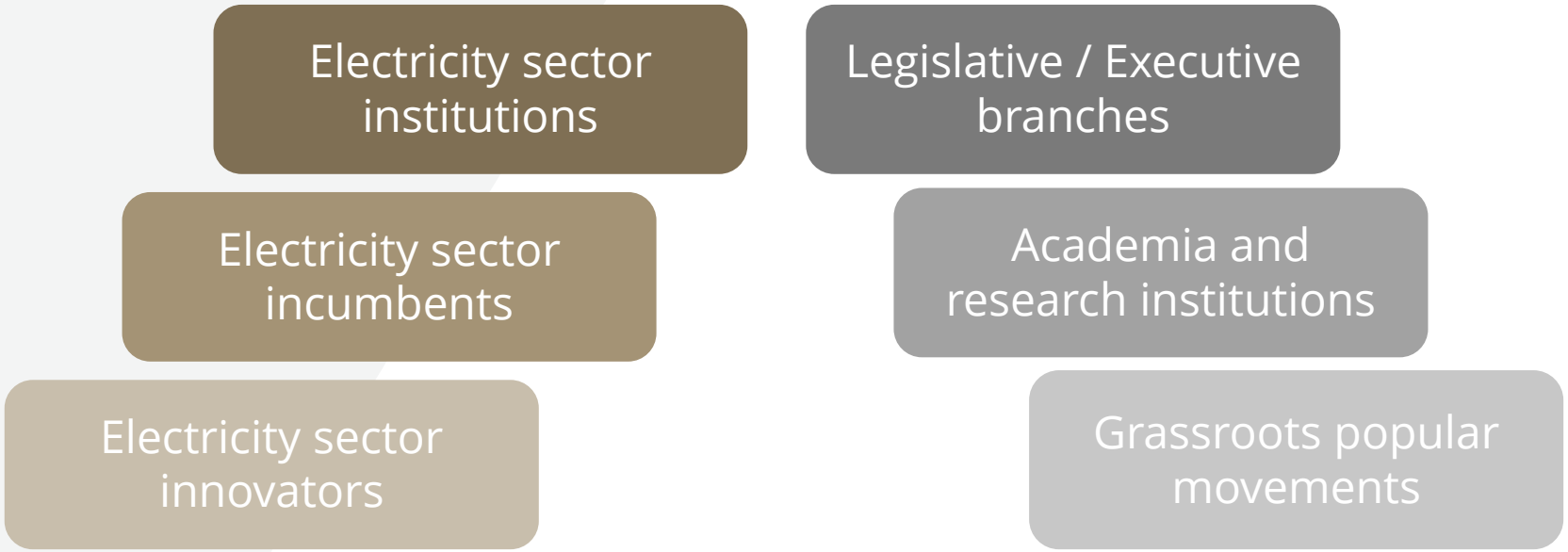
- Decarbonization
- Renewable integration
- Empowering consumers
- Utility of the future
- Political pressures to lower tariffs



So, let's reform!

Reforms can start from different groups in society…

- More "top-down" vs more "bottom-up", and "from inside" vs "from outside" the sector



Regardless of how it begins:

- Every reform **can** (potentially) be successful
- Every reform **will** involve negotiation and compromises

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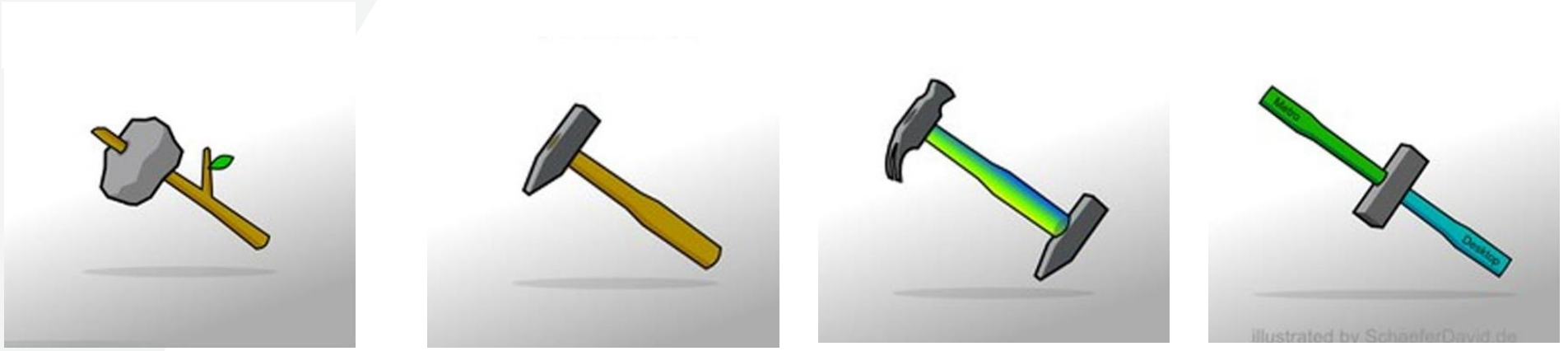
01 | Avoiding pitfalls

Why some reforms fail?

- Reform objectives are (usually) not controversial – everybody wants:
  - **Maximization of social welfare**: cheaper electricity, efficient use of country's resources
  - **More efficient decision making**: in long-term expansion and in short-term dispatch
  - A **fair assess** energy of the **energy transition complexities**: new products and services
  - **Fair and efficient risk allocation:** risks should be assigned to those that can best handle them
- **However… Most reforms fail to achieve (or achieve poorly) those objectives**



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Reason #1: Bias and lack of information

Bias and lack of information effects

Often results from **lack of dialogue** and **cooperation** (sometimes hostility) between different groups

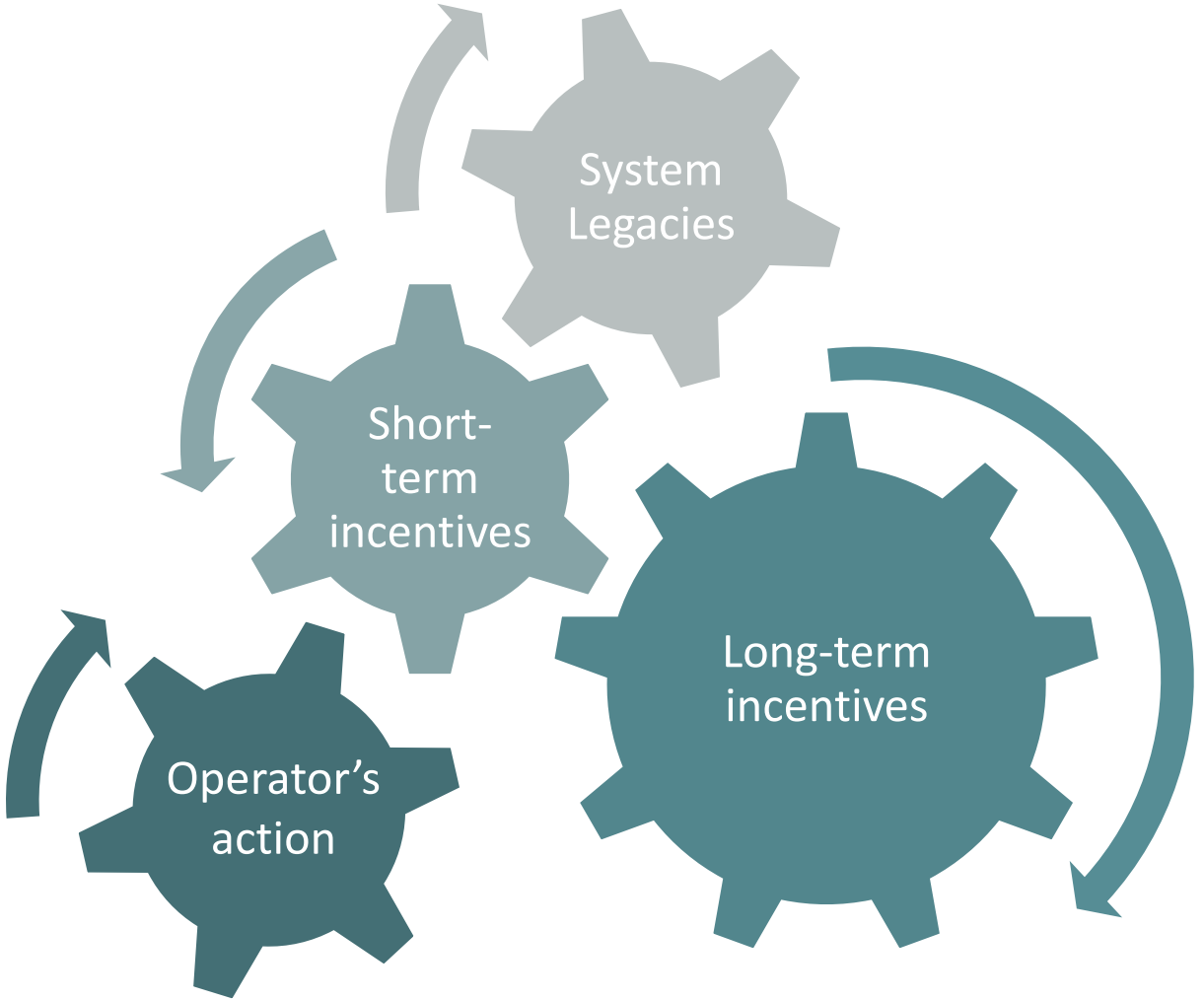
Sometimes, one group succeeds in implementing an **isolated solution** which **creates collateral problems** and costs all over the sector

Top-down	"how we do things today" bias	Ignorance of physical and technical limitations – (e.g. build a lot, it will become very cheap)
Bottom-up	"what is economically attractive today" bias	"Shiny new toys" (e.g. new technologies)

Reason #2: Disjointed market design

The electricity market has several **interdependent** (or interlocked) pieces. If you change one, for example, creating a new service or incentive, you should consider the effect on the others. Otherwise, the overall result may be negative

This **interdependence** is especially **relevant** when reaching consensus and compromises (e.g. It is easy for groups to agree when the people who will actually pay are **not** there)



How to get there…

In general, there are **many different ways** to reach policy goals – one pair of extreme alternatives is exemplified below

- Liberalized “energy-only” market
- “Trust the market”
- Incentives and price signals
- Adequacy concerns (“too much trust in markets”?)
- Other market failures

- Monopolistic state-owned control
- “Trust the government”
- Case-by-case decisions
- Inefficiency concerns (“too much trust in central planning”?)
- Other information failures

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Aiming for a “best of both worlds” strategy

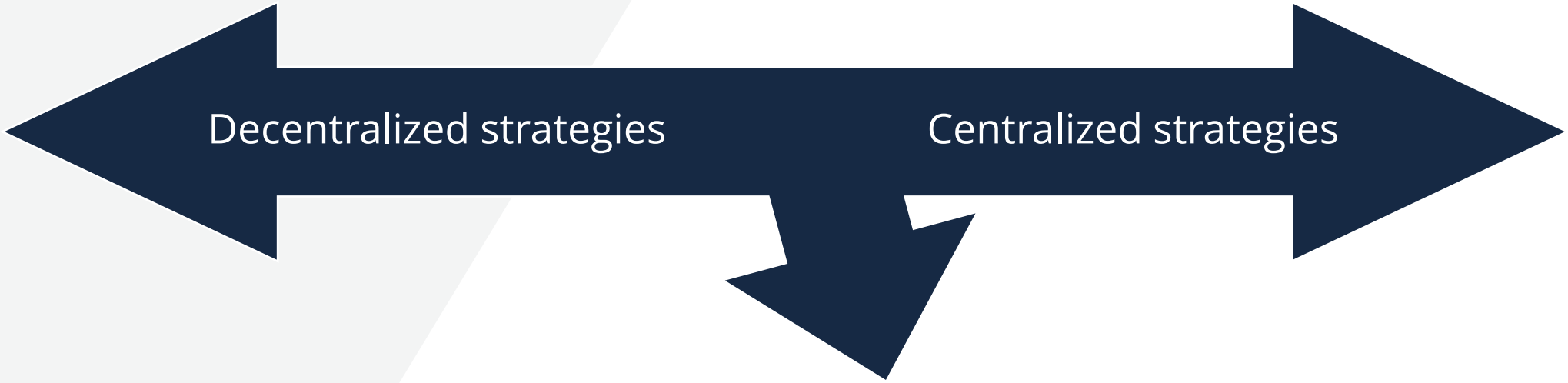
A **reliability mechanism** could be the third leg that stabilizes the stool

Reliability mechanism

- Centralized definition of quantities (demand for reliability)
- Decentralized bids sets the prices and technology mix
- Reliability providers receive to provide reliability services

However…

Assume that a **new** additional "safety net" is introduced as shown below



Reliability + government intervention

- Centralized definition of quantities (demand for reliability)
- Decentralized bids sets the prices and technology mix
- …And in addition, the government can act ad hoc to expand capacity

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What happened?

The new “government + reliability” leg may **conflict** with the incentives in the decentralized leg

Downsides

- Agents can no longer trust that the “core” reliability mechanism will drive system expansion
- Agents are incentivized to “wait and see” rather than actively seek opportunities
- Non isonomic incentives
- Additional burden on state-owned companies (or consumers)

In summary…

It is important to consider **how design elements fit into one another**

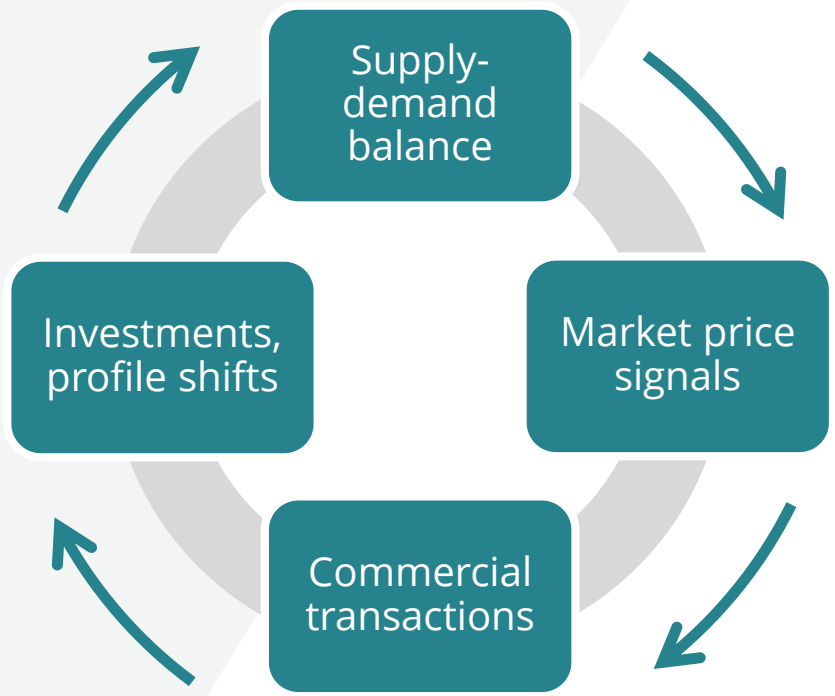
A well-designed market is **better** than the sum of its parts – strengths are **magnified** and weaknesses are **mitigated**

The devil is in the details – solutions could seem fine in isolation but integrate badly

02 Market-driven design principles

Market-driven designs

A marketplace is created, and beyond that **decentralized choices** by market players will be the chief driver of decisions



Decentralized strategies

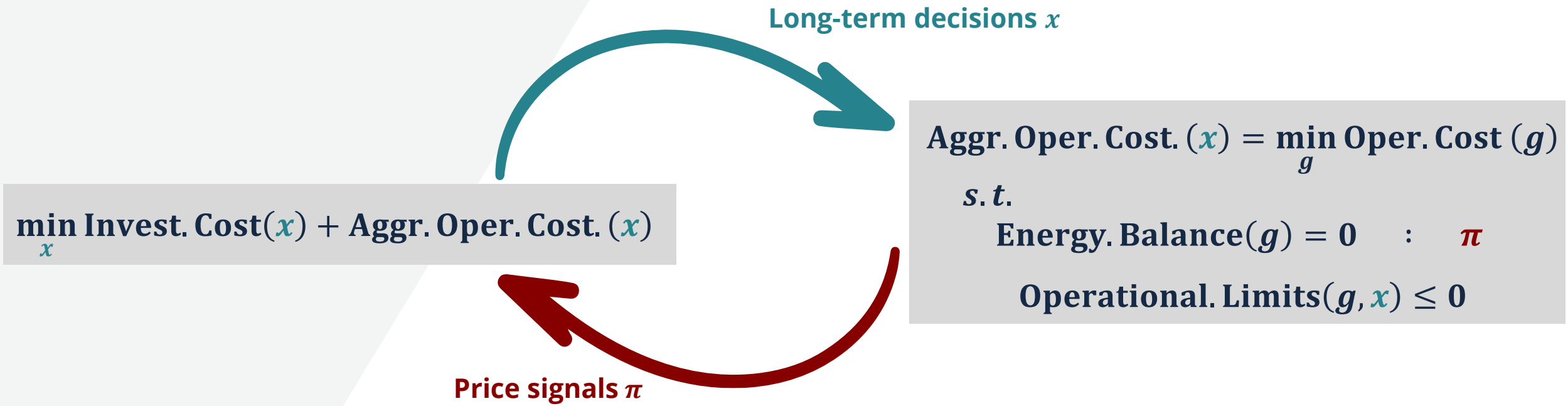
Benefits of decentralized strategies:

- Incentives for agents to innovate and provide the desired services
- Potential for newcomers and disruptors (contestability of incumbents, reduction of market power)
- Transparency in the rules of the game

The details (1/5): market frictions

At least in principle, an **energy-only market** could meet the promises of the virtuous circle, provided there are no **market frictions**

It is possible to innovate / improve on this basic design to combat such frictions



The details (2/5): accurate price signals

It is also possible / desirable to improve the **accuracy** of the problem representation and, therefore, of the underlying price signals

Long-term decisions x

$$\min_{x} \text{Invest. Cost}(x) + \text{Aggr. Oper. Cost.}\,(x)$$

$$\text{Aggr. Oper. Cost.}\,(x) = \min_{g} \text{Oper. Cost}\,(g)$$

$$s.t.$$

$$\text{Energy. Balance}(g) = 0 \quad : \quad \pi$$

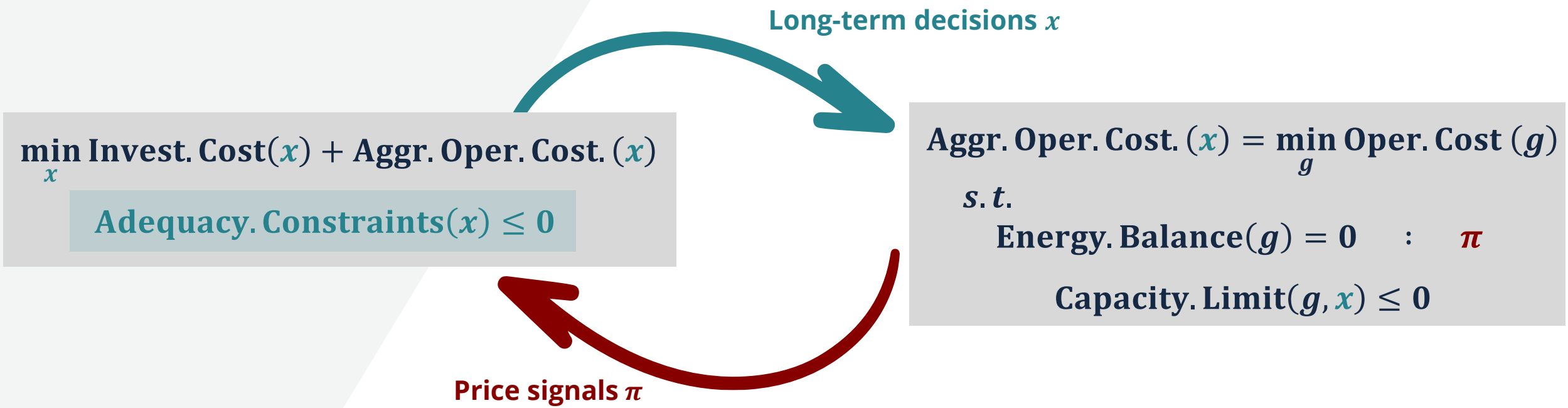
$$\text{Operational. Limits}(g, x) \leq 0$$

Price signals π

The detais (3/5): Long-term markets

New products can be introduced in a **long-term market**

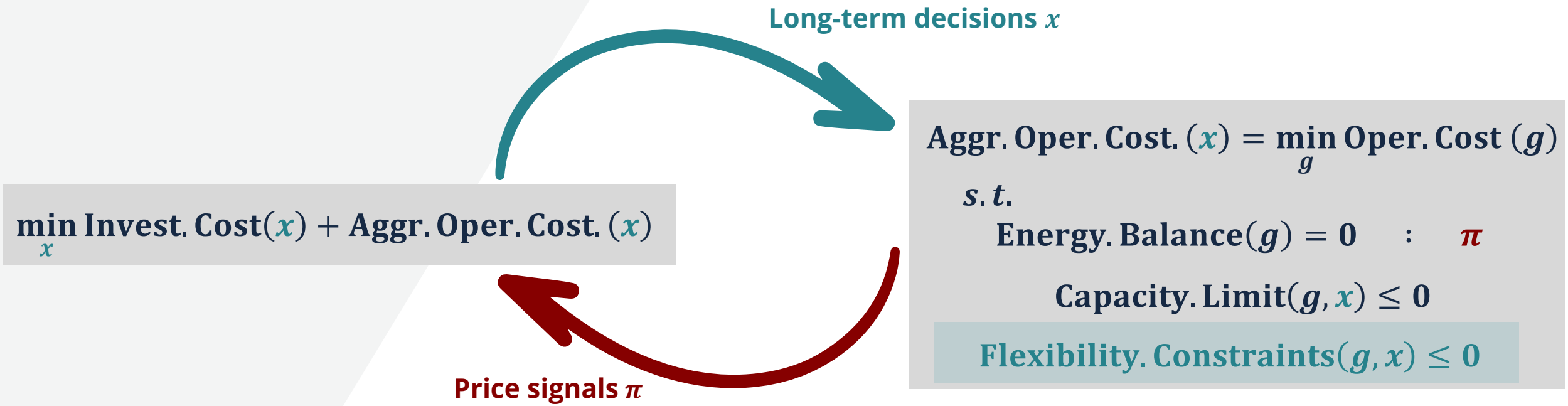
Reliability is an example of a product suitable for the long-term market



The details (4/5): Short-term markets

Other products can be introduced into a **short-term market**

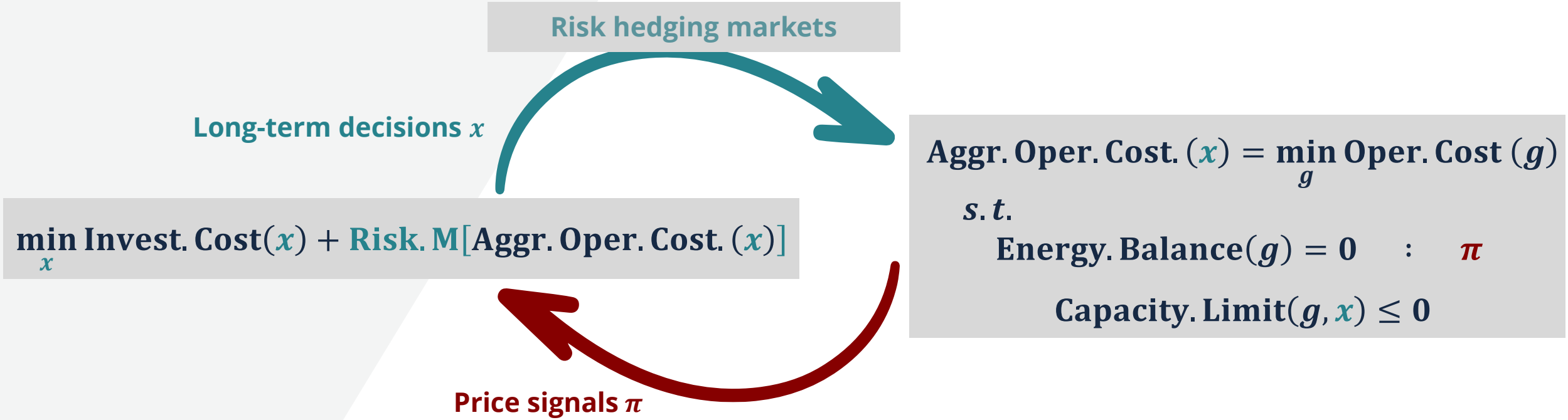
Reserve is an example of a product suitable for a short-term market



The details (5/5): Risk hedging markets

These markets are usually based on **financial instruments** (forward contracts, options etc.) and allow agents to to better manage their risks

Two-sided auctions are an example of a product facilitator market



In summary...

Accuracy

- Bid-based VS cost-based
- Temporal and spatial granularity
- Ramping constraints (adding or refining)
- Commitment constraints
- Demand-side features

Long-term markets

- Firm capacity market
- Reliability options market
- Green certificates
- Ancillary services

Short-term markets

- Operating reserves (primary and secondary) with short-term price
- Sloped demand for reserves
- CO2 pricing schemes

Hedging markets

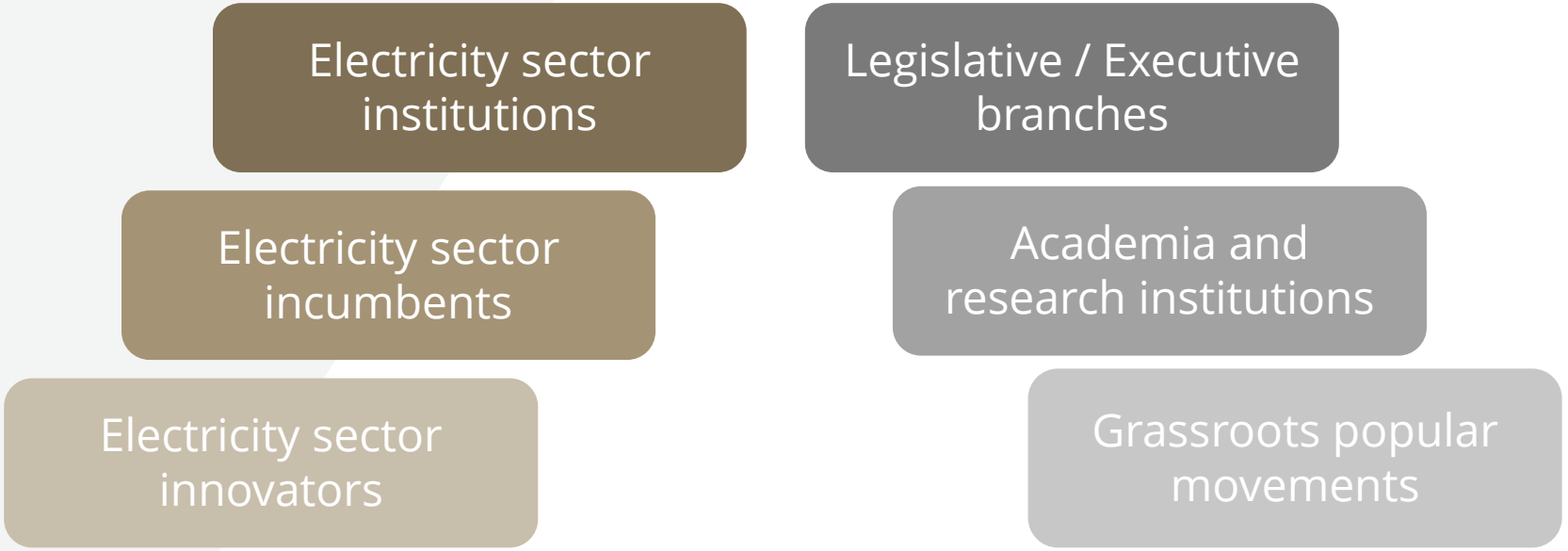
- Two-sided auctions
- Energy exchanges
- Contract marketplaces
- Multi-settlement schemes

03 | Making it happen

Making sure that the result is a good reform

Dialogue with society is very important!

Always be aware of the various groups involved – in the "**macro**" level…



Making sure that the result is a good reform

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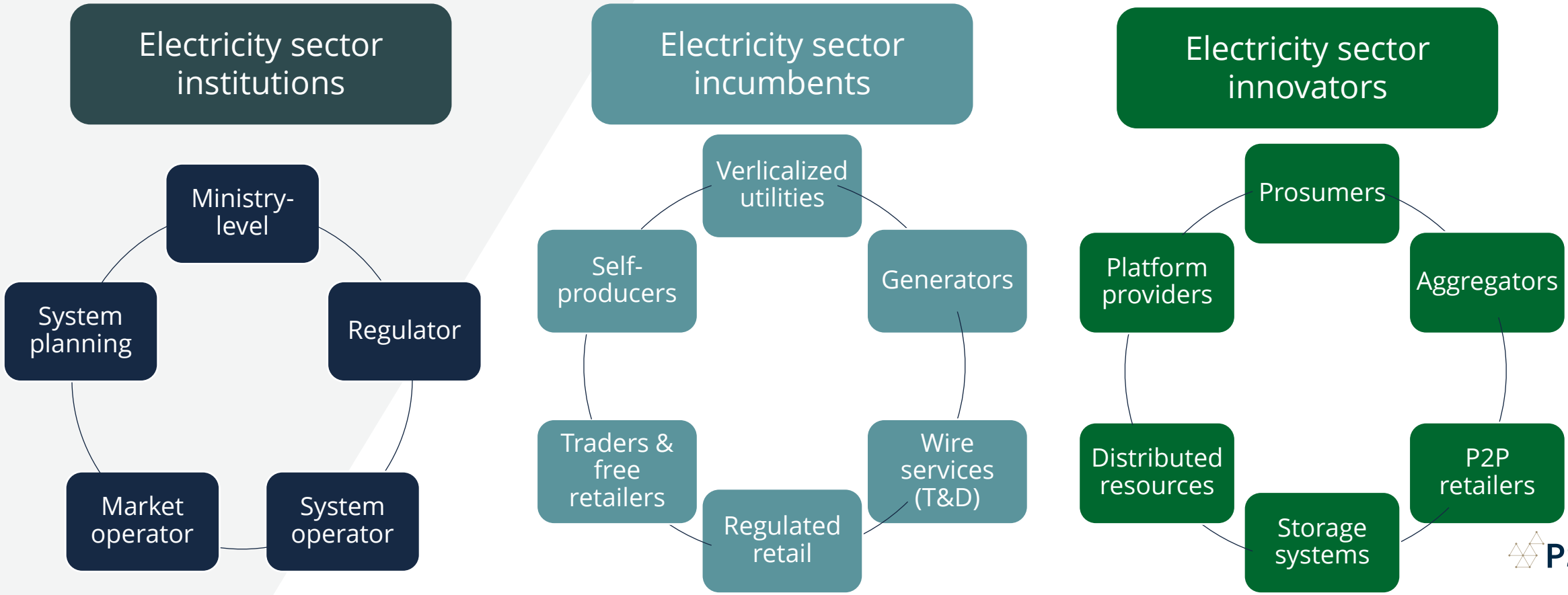
…and in the "**micro**" level!



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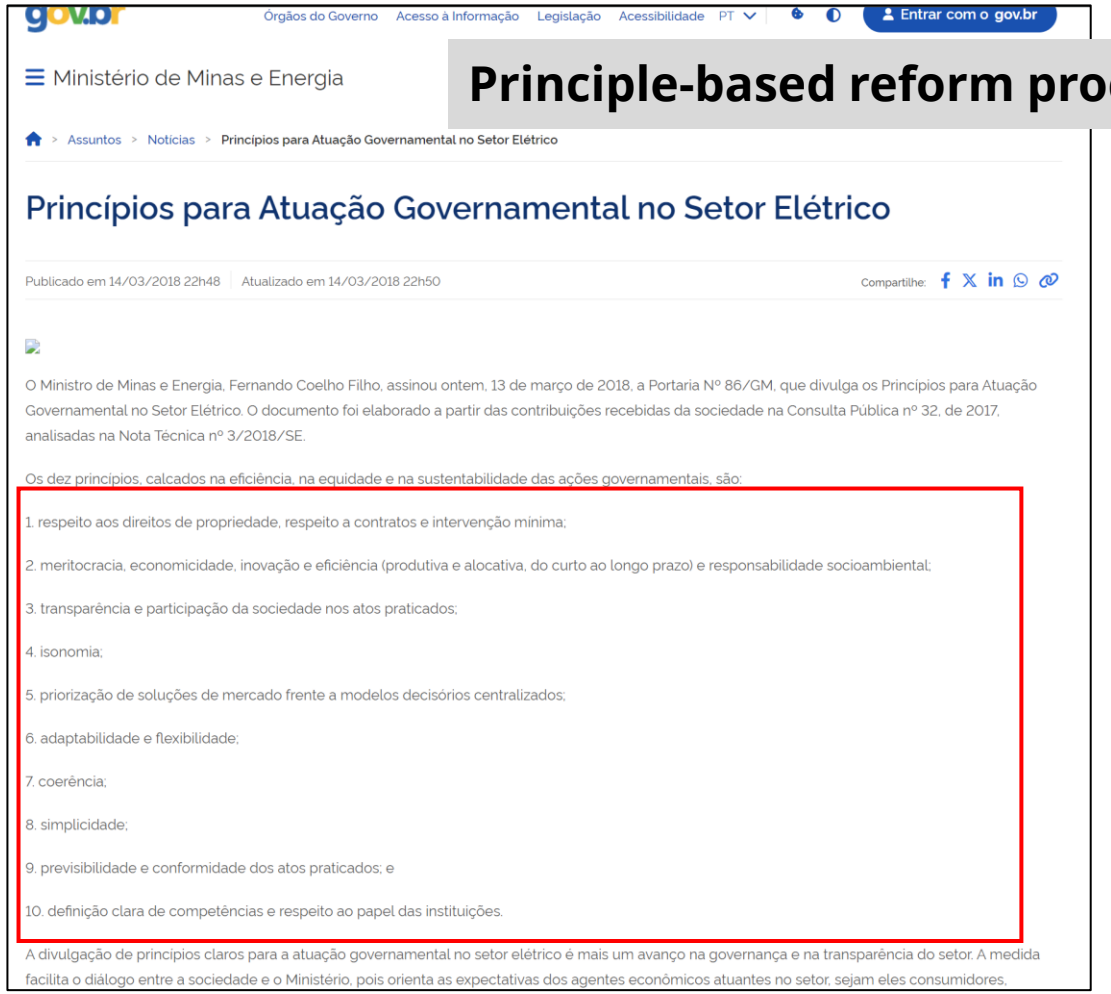
Trying to make it happen: the Brazilian 2017/18 experience

Motivation:

- Cost-based dispatch challenged, spot prices not credible
- Centralization of risk management decisions in government hands has been challenged
- Products offered often have a too long duration
- Technology-specific products fragmented the procurement process
- Consumer empowerment on the way
- Distribution companies need a (proper) future
- And others

Definitions of **principles** for the **government rulemaking**:

Principle-based reform process



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Ministério de Minas e Energia

Assuntos > Notícias > Princípios para Atuação Governamental no Setor Elétrico

Princípios para Atuação Governamental no Setor Elétrico

Publicado em 14/03/2018 22h48 Atualizado em 14/03/2018 22h50 Compartilhe:

O Ministro de Minas e Energia, Fernando Coelho Filho, assinou ontem, 13 de março de 2018, a Portaria Nº 86/GM, que divulga os Princípios para Atuação Governamental no Setor Elétrico. O documento foi elaborado a partir das contribuições recebidas da sociedade na Consulta Pública nº 32, de 2017, analisadas na Nota Técnica nº 3/2018/SE.

Os dez princípios, calcados na eficiência, na equidade e na sustentabilidade das ações governamentais, são:

1. respeito aos direitos de propriedade, respeito a contratos e intervenção mínima;
2. meritocracia, economicidade, inovação e eficiência (produtiva e alocativa, do curto ao longo prazo) e responsabilidade socioambiental;
3. transparência e participação da sociedade nos atos praticados;
4. isonomia;
5. priorização de soluções de mercado frente a modelos decisórios centralizados;
6. adaptabilidade e flexibilidade;
7. coerência;
8. simplicidade;
9. previsibilidade e conformidade dos atos praticados; e
10. definição clara de competências e respeito ao papel das instituições.

A divulgação de princípios claros para a atuação governamental no setor elétrico é mais um avanço na governança e na transparência do setor. A medida facilita o diálogo entre a sociedade e o Ministério, pois orienta as expectativas dos agentes econômicos atuantes no setor, sejam eles consumidores,

Source: http://portalh.mme.gov.br/web/guest/todas-as-noticias/-/asset_publisher/pdAS9IcdBICN/content/principios-para-atuacao-governamental-no-setor-eletrico
Texto principios: https://antigo.mme.gov.br/c/document_library/get_file?uuid=d6443a1f-3a45-cba2-7eae-67e1a005e40d&groupId=36131

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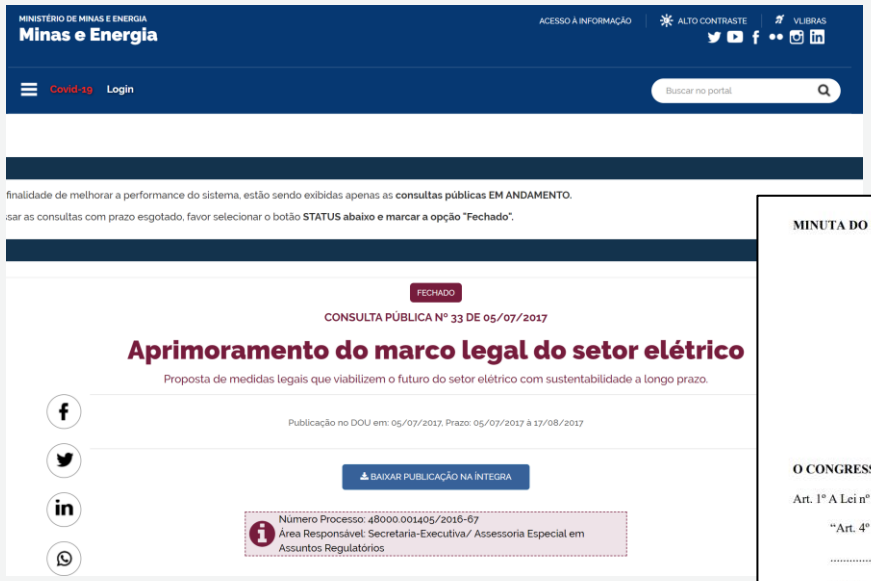
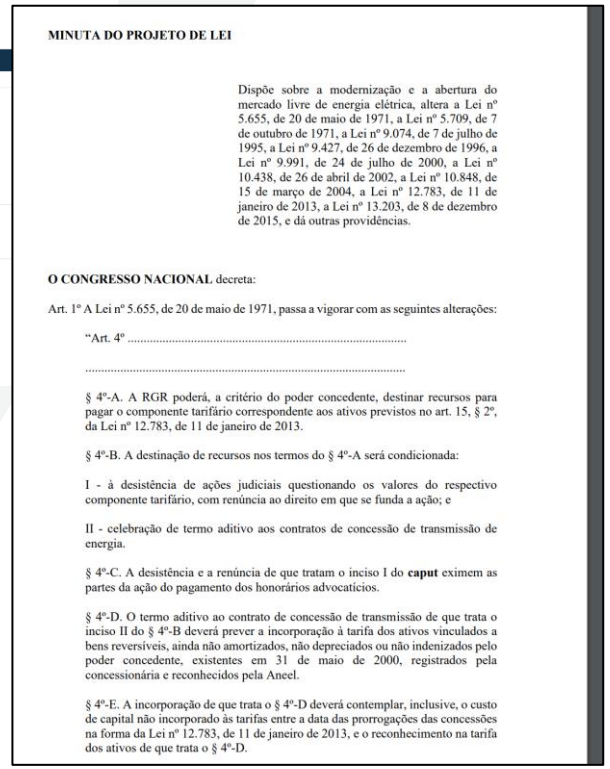
Trying to make it happen: the Brazilian 2017/18 experience

- Government bill proposal via a public consultation :





MINUTA DO PROJETO DE LEI

Dispõe sobre a modernização e a abertura do mercado livre de energia elétrica, altera a Lei nº 5.655, de 20 de maio de 1971, a Lei nº 5.709, de 7 de outubro de 1971, a Lei nº 9.074, de 7 de julho de 1995, a Lei nº 9.427, de 26 de dezembro de 1996, a Lei nº 9.991, de 24 de julho de 2000, a Lei nº 10.438, de 26 de abril de 2002, a Lei nº 10.848, de 15 de março de 2004, a Lei nº 12.783, de 11 de janeiro de 2013, a Lei nº 13.203, de 8 de dezembro de 2015, e dá outras providências.

O CONGRESSO NACIONAL decreta:

Art. 1º A Lei nº 5.655, de 20 de maio de 1971, passa a vigorar com as seguintes alterações:

"Art. 4º .....

.....

§ 4º-A. A RGR poderá, a critério do poder concedente, destinar recursos para pagar o componente tarifário correspondente aos ativos previstos no art. 15, § 2º, da Lei nº 12.783, de 11 de janeiro de 2013.

§ 4º-B. A destinação de recursos nos termos do § 4º-A será condicionada:

I - à desistência de ações judiciais questionando os valores do respectivo componente tarifário, com renúncia ao direito em que se funda a ação; e

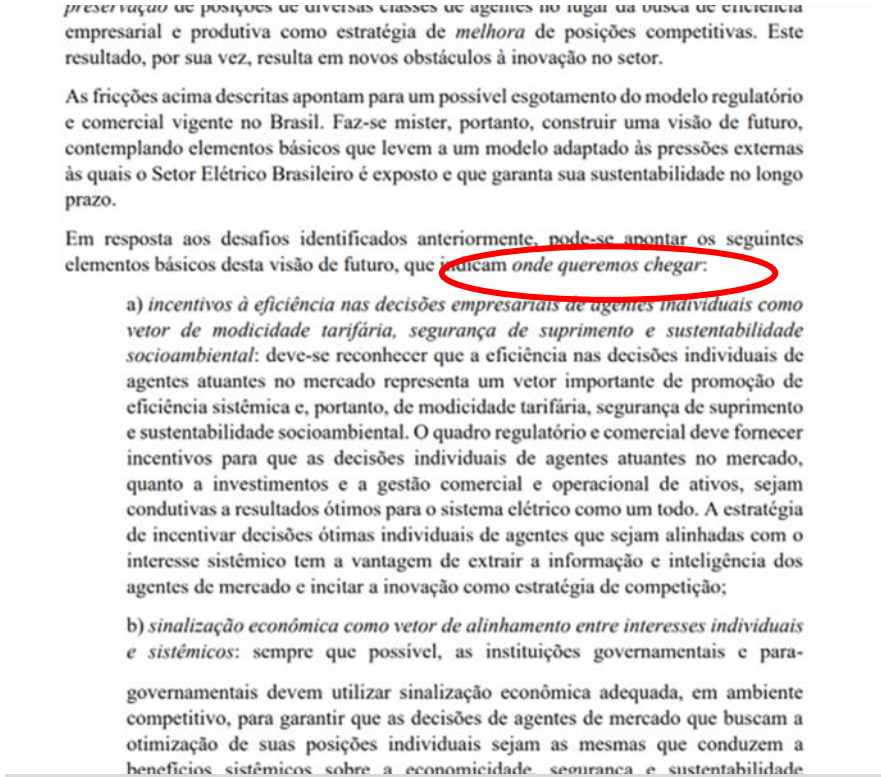
II - celebração de termo aditivo aos contratos de concessão de transmissão de energia.

§ 4º-C. A desistência e a renúncia de que tratam o inciso I do **caput** eximem as partes da ação do pagamento dos honorários advocatícios.

§ 4º-D. O termo aditivo ao contrato de concessão de transmissão de que trata o inciso II do § 4º-B deverá prever a incorporação à tarifa dos ativos vinculados a bens reversíveis, ainda não amortizados, não depreciados ou não indenizados pelo poder concedente, existentes em 31 de maio de 2000, registrados pela concessionária e reconhecidos pela Aneel.

§ 4º-E. A incorporação de que trata o § 4º-D deverá contemplar, inclusive, o custo de capital não incorporado às tarifas entre a data das prorrogações das concessões na forma da Lei nº 12.783, de 11 de janeiro de 2013, e o reconhecimento na tarifa dos ativos de que trata o § 4º-D.

- Defined through a long-term view:



empresarial e produtiva como estratégia de *melhora* de posições competitivas. Este resultado, por sua vez, resulta em novos obstáculos à inovação no setor.

As fricções acima descritas apontam para um possível esgotamento do modelo regulatório e comercial vigente no Brasil. Faz-se mister, portanto, construir uma visão de futuro, contemplando elementos básicos que levem a um modelo adaptado às pressões externas às quais o Setor Elétrico Brasileiro é exposto e que garanta sua sustentabilidade no longo prazo.

Em resposta aos desafios identificados anteriormente, pode-se apontar os seguintes elementos básicos desta visão de futuro, que indicam *onde queremos chegar*:

a) *incentivos à eficiência nas decisões empresariais de agentes individuais como vetor de modicidade tarifária, segurança de suprimento e sustentabilidade socioambiental*: deve-se reconhecer que a eficiência nas decisões individuais de agentes atuantes no mercado representa um vetor importante de promoção de eficiência sistêmica e, portanto, de modicidade tarifária, segurança de suprimento e sustentabilidade socioambiental. O quadro regulatório e comercial deve fornecer incentivos para que as decisões individuais de agentes atuantes no mercado, quanto a investimentos e a gestão comercial e operacional de ativos, sejam condutivas a resultados ótimos para o sistema elétrico como um todo. A estratégia de incentivar decisões ótimas individuais de agentes que sejam alinhadas com o interesse sistêmico tem a vantagem de extrair a informação e inteligência dos agentes de mercado e incitar a inovação como estratégia de competição;

b) *sinalização econômica como vetor de alinhamento entre interesses individuais e sistêmicos*: sempre que possível, as instituições governamentais e para-

governamentais devem utilizar sinalização econômica adequada, em ambiente competitivo, para garantir que as decisões de agentes de mercado que buscam a otimização de suas posições individuais sejam as mesmas que conduzem a benefícios sistêmicos sobre a economicidade, segurança e sustentabilidade

Tenths of contributions, and final bill project still being discussed (in 2023!)

Source: https://antigo.mme.gov.br/pt/web/guest/servicos/consultas-publicas?p_p_id=consultapublicammeportlet_WAR_consultapublicammeportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=3&_consultapublicammeportlet_WAR_consultapublicammeportlet_view=detalharConsulta&resourcePrimKey=517270&detalharConsulta=true&entryId=517272

04 | How not to make it happen

How not to make it happen: interventionism

- "**Godzilla-style**" policy decisions in 2012 have undermined the credibility of the Brazilian power market after a provisional measure ("**MP 579**") was issued:
  - **Interference** in the of State-owned companies towards actions to lower tariffs
  - **Treasury funds used** achieve the politically-made tariff reductions
  - **Consumers paid the bill:** tariff increases more than made up for the promised reduction
  - **Interference in the sector decreased value of assets and increased cost of debt**

- A worldwide example of **how not to do things:**
  - **No** discussion with Society
  - **No** discussion with Stakeholders
  - **No** quantitative impact assessment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Economia

Governo federal perdeu R$ 105 bi com crise do setor elétrico

Rombo se deve, principalmente, à Medida Provisória 579, que reduziu as tarifas de energia via renovação antecipada de concessões

Por **Da Redação**
4 nov 2014, 11h39

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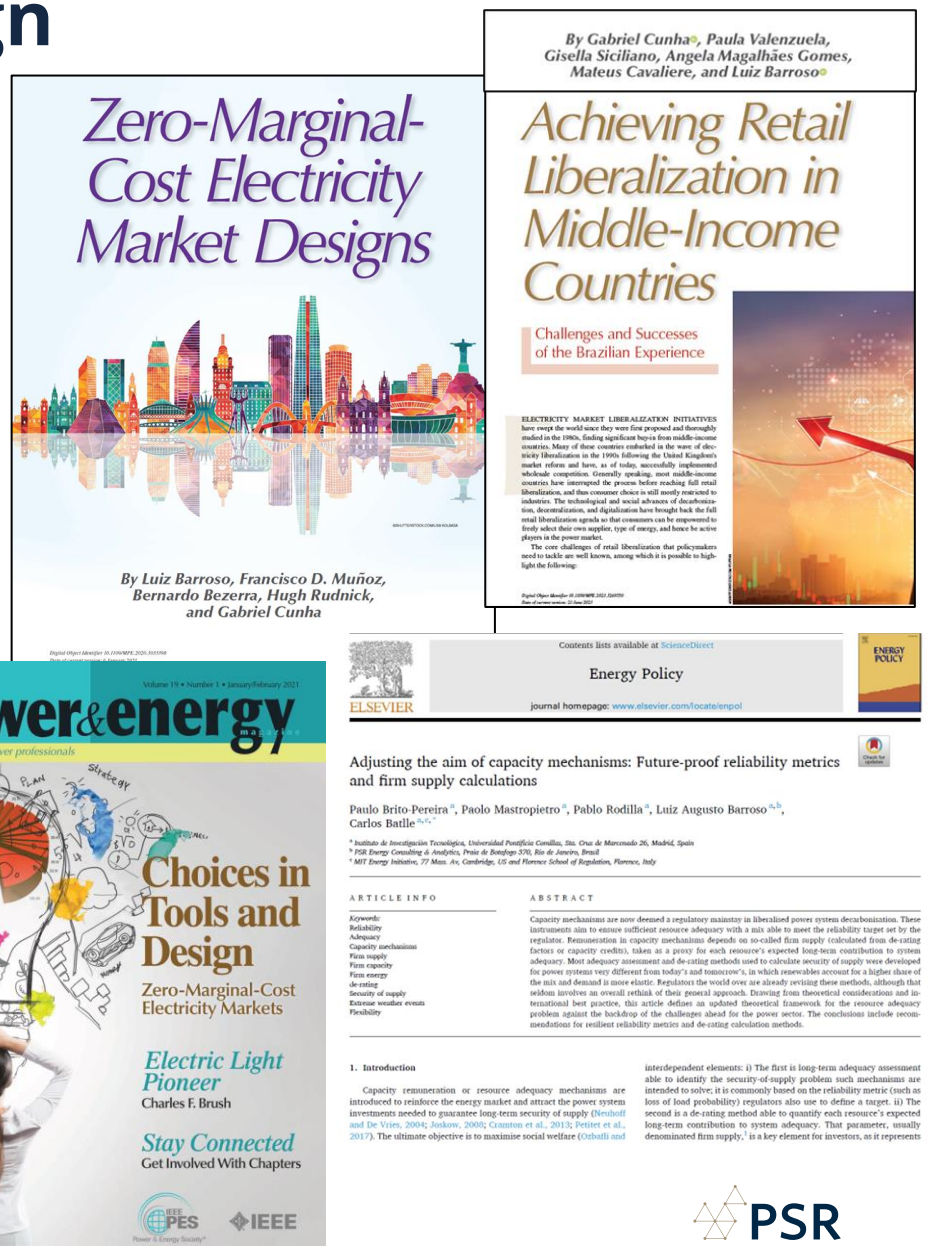
05 | Conclusions

How to get there: Key takeaways

- Two steps: choosing **what to do** and **how to do it**
- For an effective market reform (**what to do**):
  - Have a clear goal and long-term vision
  - Obtain key information from different groups (even external to the electricity sector)
  - Focus on positive-sum initiatives that will benefit everyone
  - Maintain a birds' eye view of the reform elements and how they fit into the big picture
- For the reform to actually happen (**how to do it**):
  - Understand your audience, including subdivisions/factions and individual agents
  - Ample use of public hearings and similar mechanisms
  - Understand what went wrong in past reforms and what can be improved – avoid "just do better this time"

The future-proof electricity market design

- Centralized management of reliability (reliability options are the global reference)
- Climate-resilient reliability metrics (energy, capacity and flexibility): system planning will be everything
- Hybrid markets: connection between long- and short-term signals
- Pricing of services delivered by the different technologies
- More liquidity in contract markets (marketplaces and retail aggregators)
- Market monitoring & market power mitgation
- Transmission as flexible assets, distribution as platforms
- Less subsidies



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