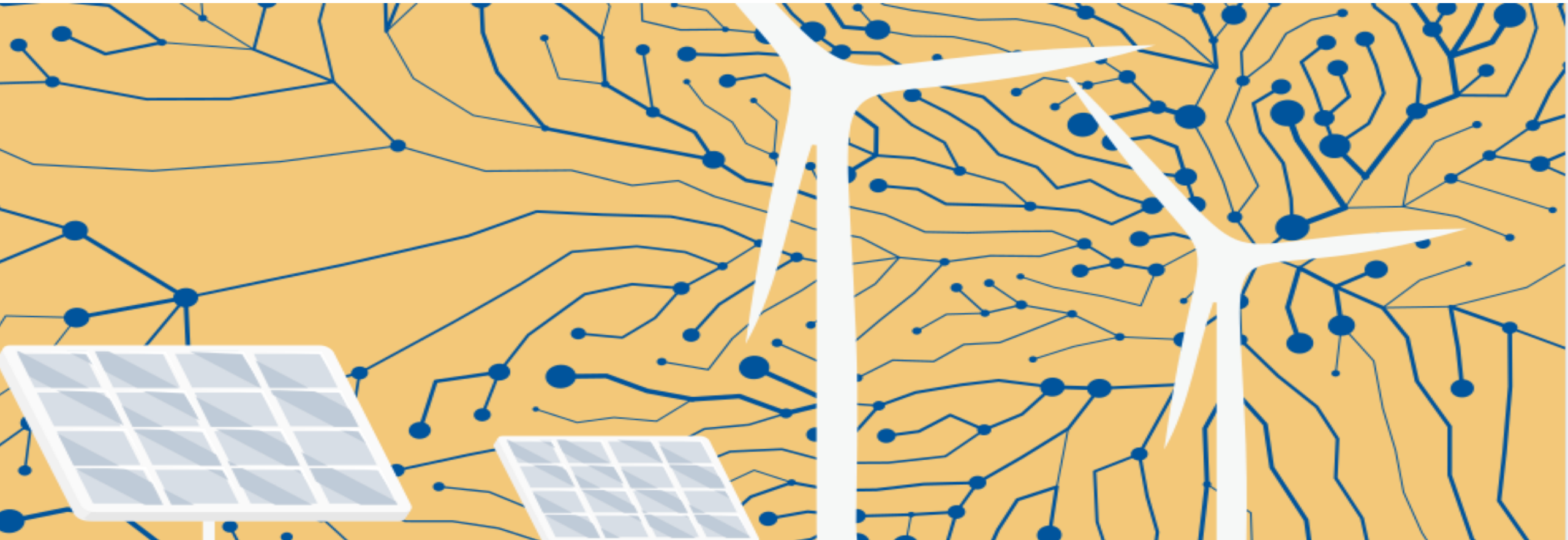
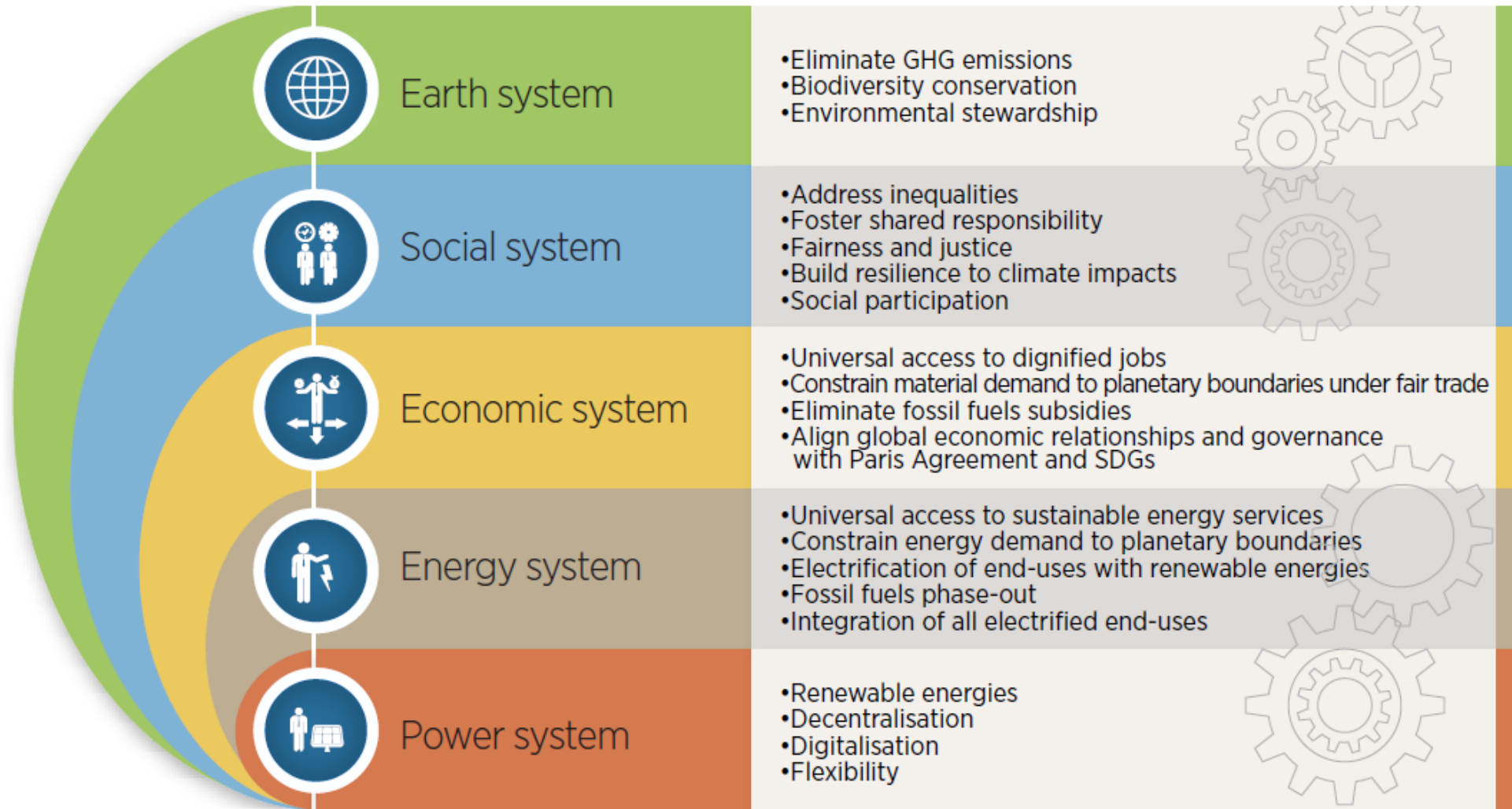


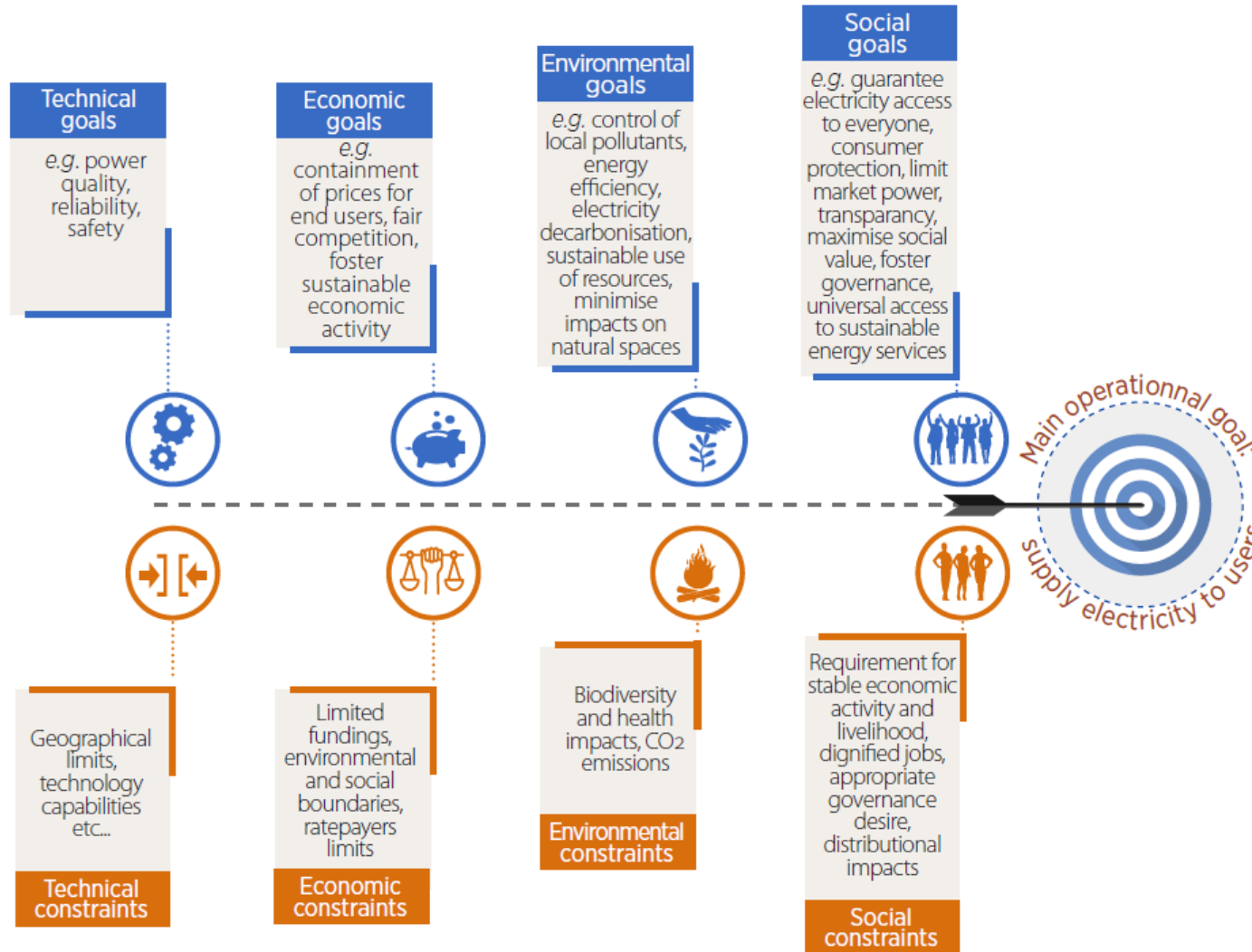
# RE-organising power systems for the transition: an international challenge?



# Beyond the power sector

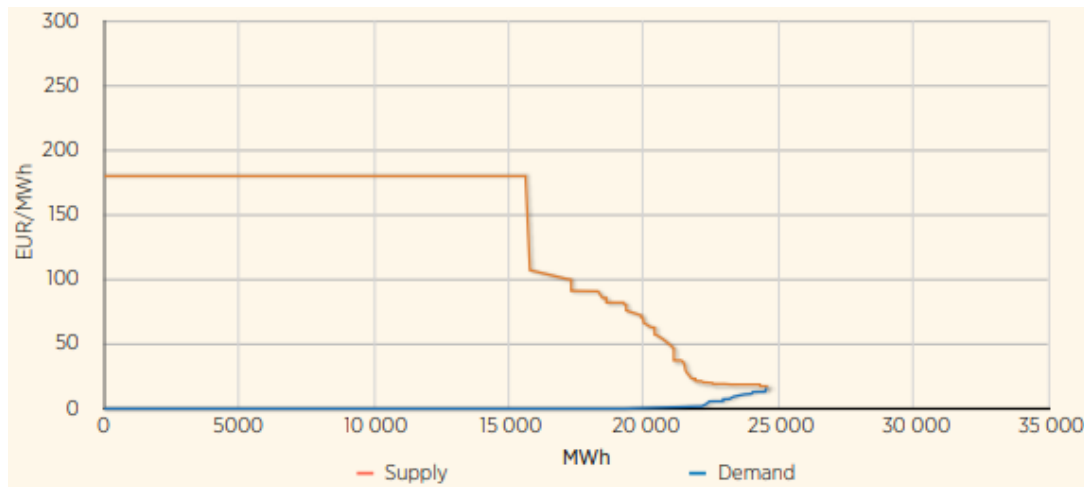


# Power system goals

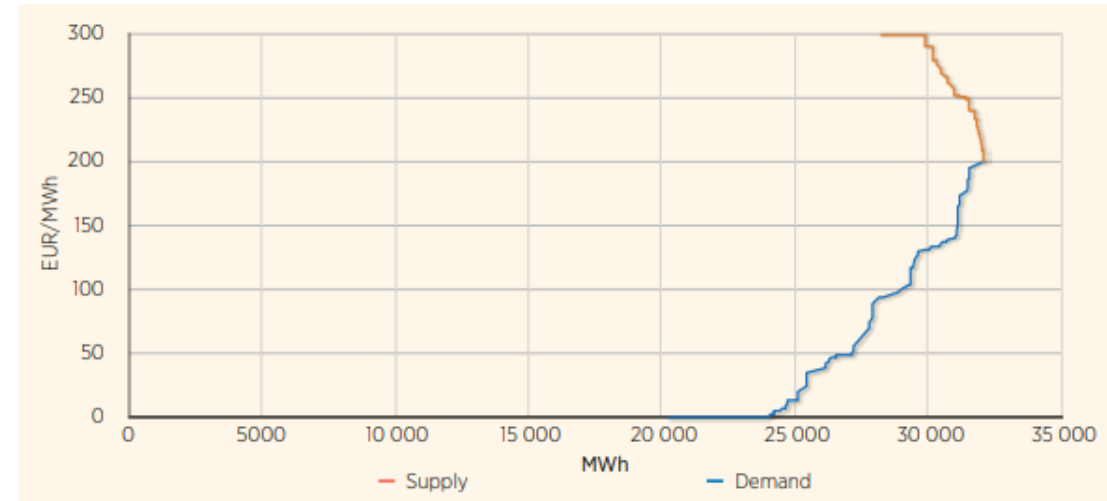


# How it started... and how it went

## Supply and demand curves in the wholesale power market in Spain, 12 pm, 16 April 2020



## Supply and demand curves in the wholesale power market in Spain, 12 pm on 18 November 2021



- The power price crisis opened a new, unexpected window of opportunity to talk about power system reform. Still, the core issue goes beyond the natural gas price spike!
- A multi-dimensional crisis that must be tackled holistically.

The unintentional inefficient outcomes of the interaction between renewable power generation policies and the design of the power system's organisational structure, as well as the intrinsic incapability of current organisational structures to foster and sustain a power system based on renewable generation.

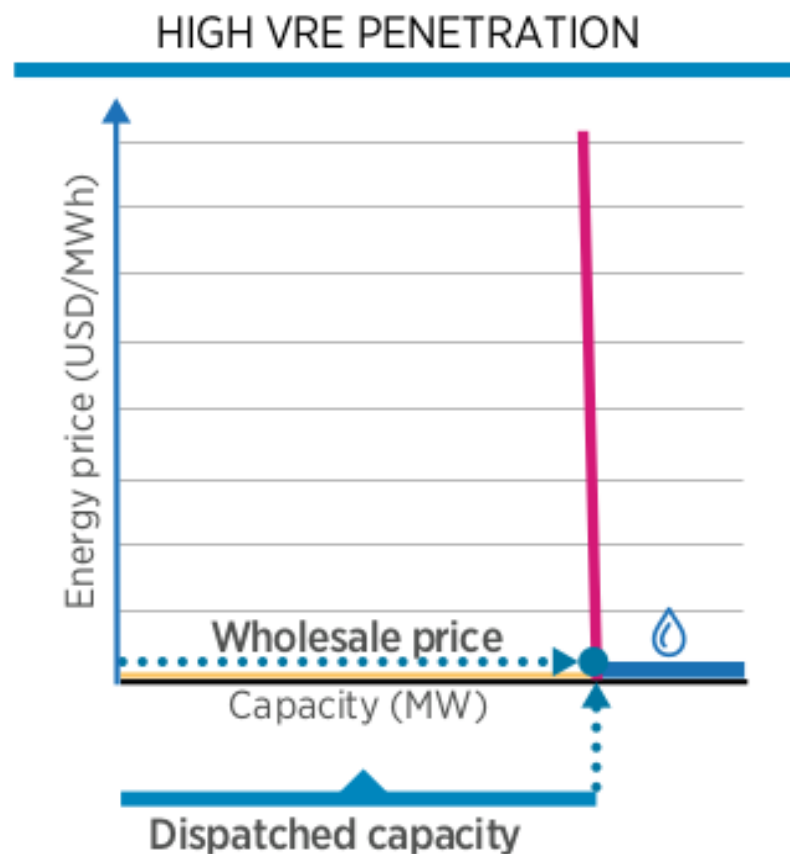
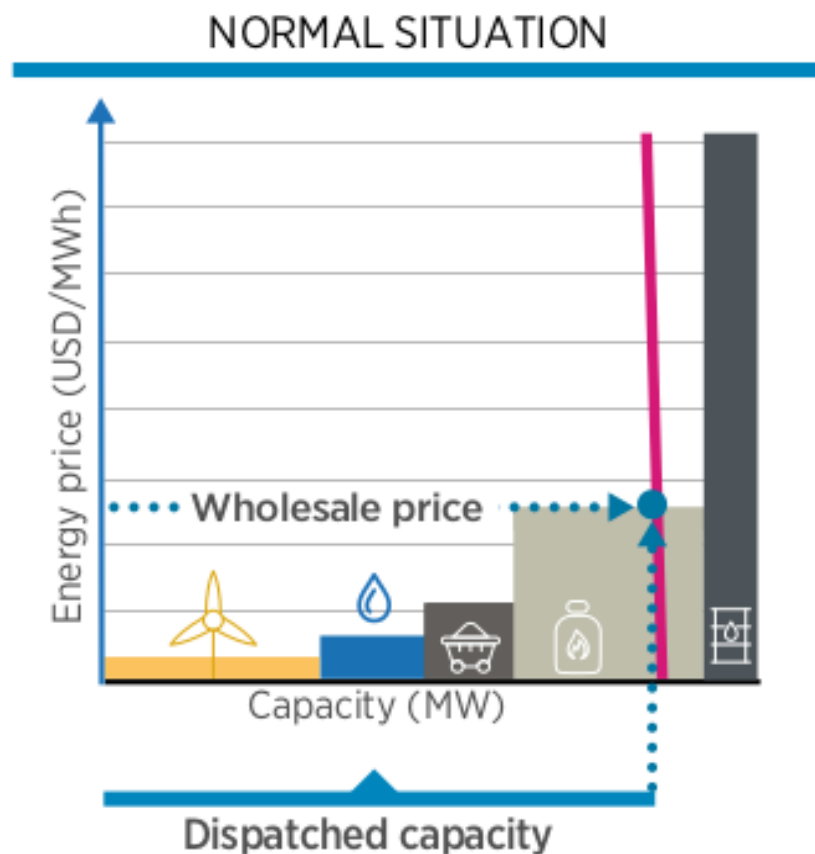
## Within the power system:

- Wholesale electricity pricing
- CRM for fossil fuels
- ancillary services gaps
- bills' disconnect with transition
- grid death spiral
- cost, price and value misalignment

## Beyond the power system:

- labour dynamics during the transition
- aggregated economic activity growth imperative
- inequality

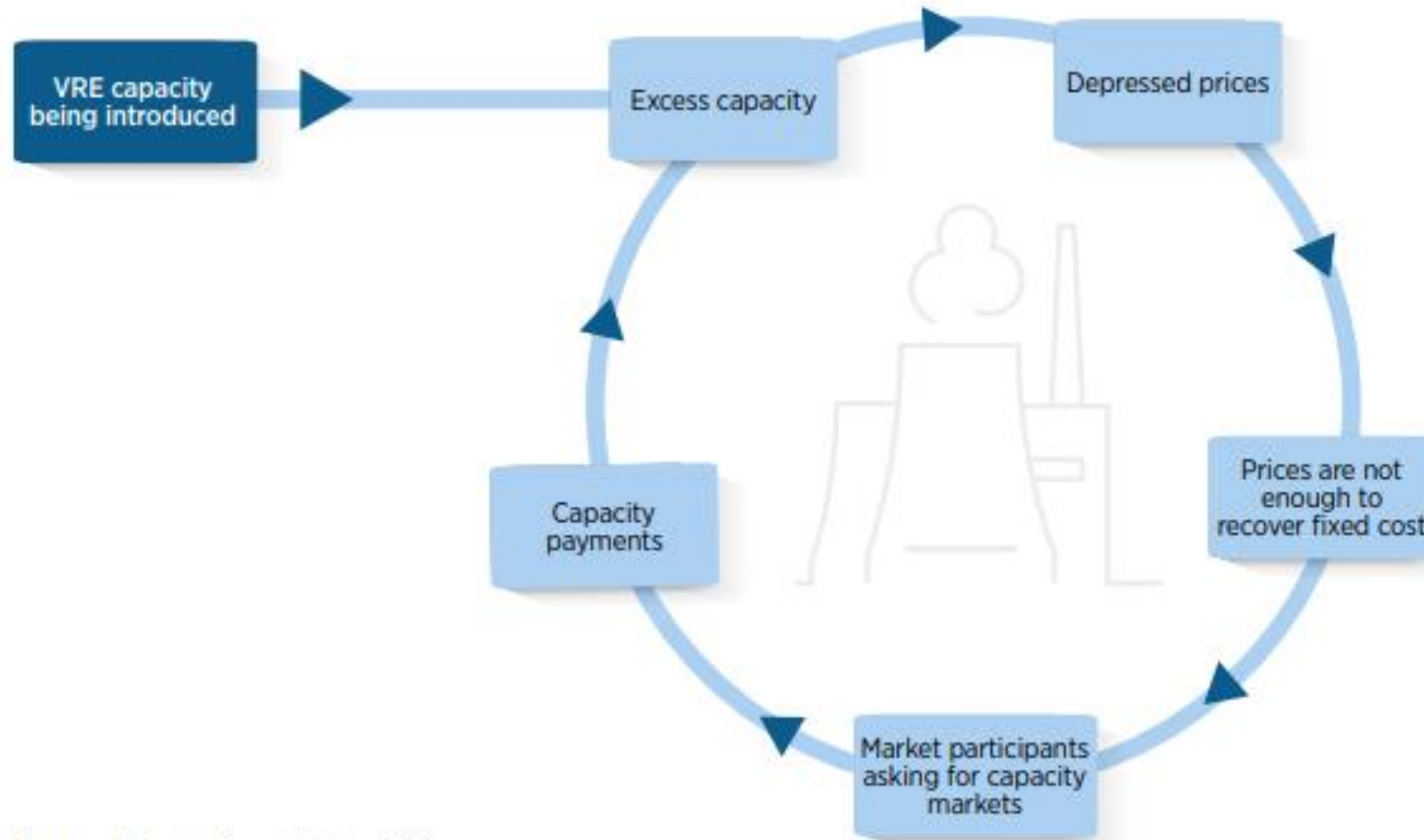
# Wholesale market misalignments



- VRE
- Hydropower
- Coal
- Gas
- Oil/Peaking plant
- Demand



# The capacity payments feedback loop

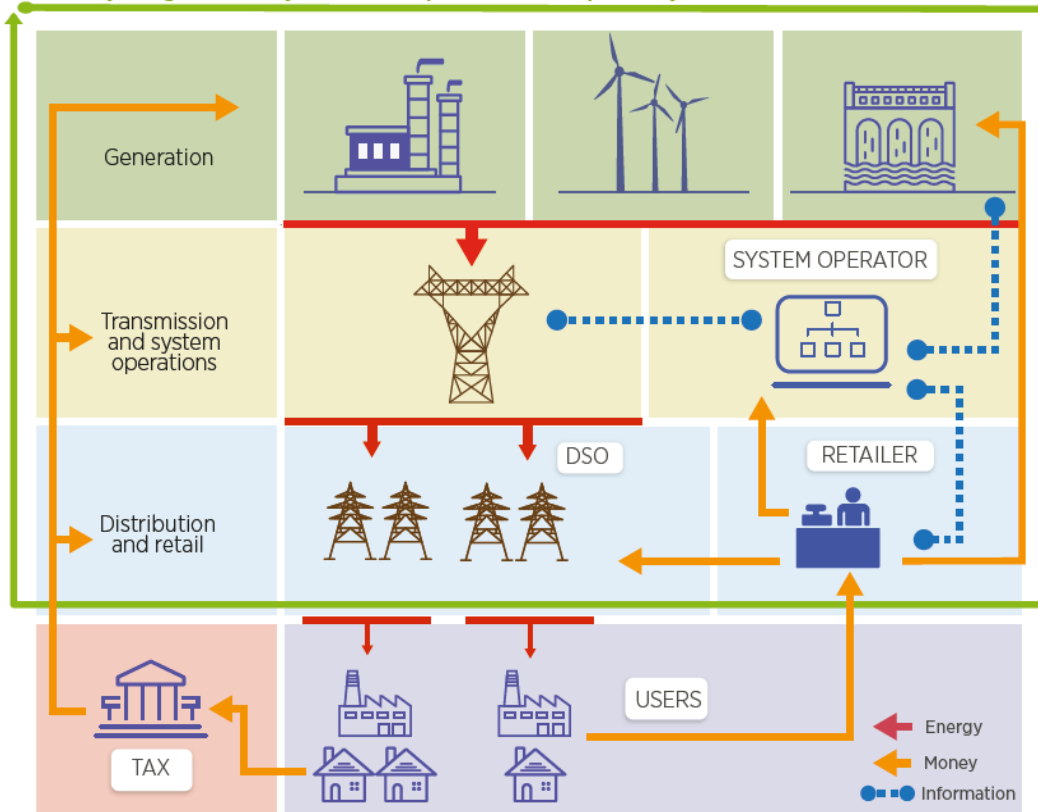


Source: Adapted from Muñoz, 2019.

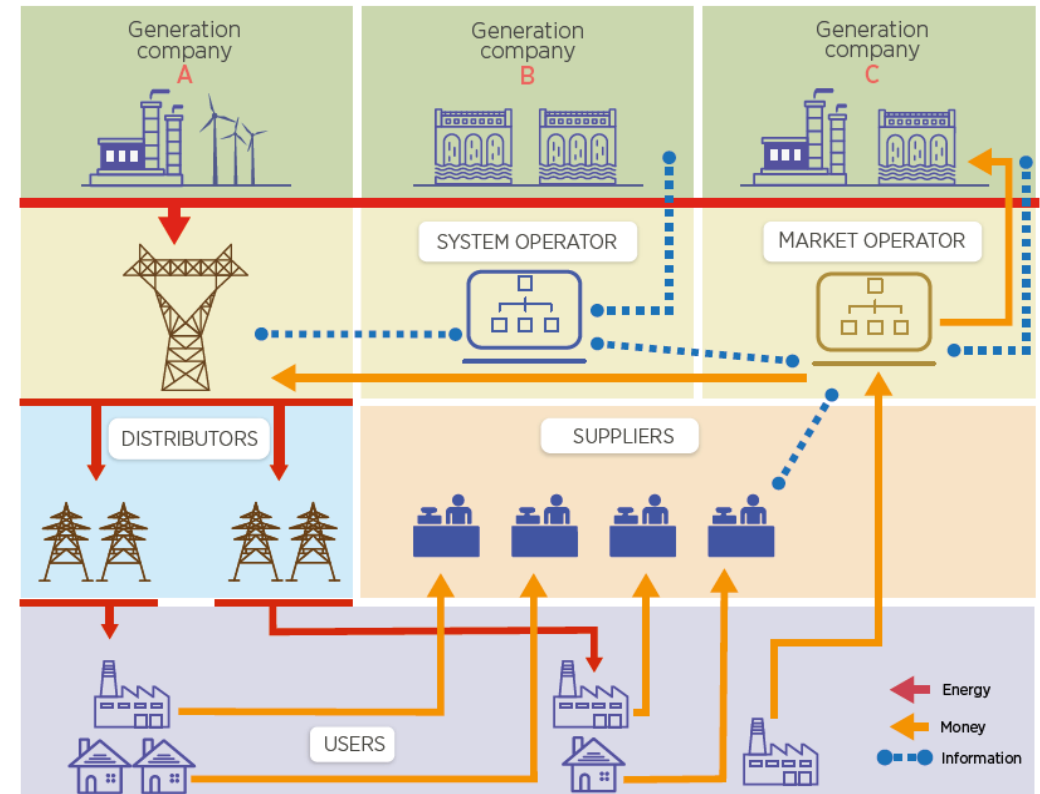
# Regulated vs Liberalised?

## Regulated systems

Vertically integrated utility: owns and operates the full power system

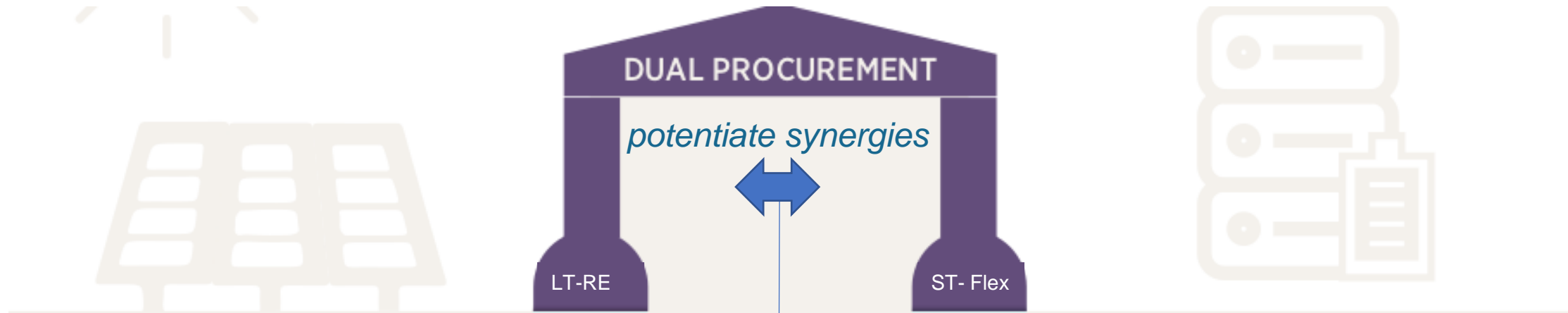


## Liberalised systems





# Long- and short-term pillars of the dual-procurement system



- **Procure RE generation through long term mechanisms** (auctions or direct public investment)
  - fit for high-CAPEX / low-OPEX generation
  - fosters electricity adequacy
  - minimizes finance costs
  - driven by LT planning with a focus on system value

- **Procure Flexibility through dedicated short-term mechanisms** (similar to wholesale/ancillary services)
  - enables flexibility resources participation (DSM, storage, dispatchable REs)
  - fosters flexibility adequacy
  - driven by ST dispatch requirements

# Characteristics of the long- and short-term mechanisms under the dual-procurement system

LT-RE PROCUREMENT	ST-Flex PROCUREMENT
Based on <b>periodic long-term product-based allocation</b> mechanisms (auctions, direct public investment...)	Based on the <b>short-term dimension of current dispatch</b> mechanisms (balancing markets, regulated dispatch, ...)
Procures <b>renewable electricity</b> (VRE and dispatchable RE) and enables <b>RE supply adequacy</b> with the adequate anticipation	Procures <b>flexibility</b> (DSM, DER, storage, dispatchable RE, P2X, V2G, ...) and enables <b>flexibility supply adequacy</b>
Designed to <b>match supply and demand</b> as much as possible <b>on the long-term</b> (capturing temporal and locational value to the power system)	<b>Matching supply and demand on the short and very short term</b> (capturing temporal and locational value to the power system)
Driven by long-term load forecast within integrated energy planning	Driven by the short- and very-short term deviations between the scheduled load/REs production and real demand/production
Provides a safe investment environment that minimizes finance costs for CAPEX-intensive technologies	<p><b>Liberalized systems:</b> allowing prices to vary from very high to low and even negative. Additional regulated payments if needed (especially during the transition period: LT-Flex)</p> <p><b>Regulated systems:</b> enabling framework for deploying and operating the required flexibility capacity</p>
The dual procurement <b>economic signals should reach the retail rates</b> (or prices) of all users to promote their participation in system operation, while simultaneously addressing distributional issues so that collaborative engagement is achieved in a just transition.	
<b>Socially-wide collaborative governance</b> (public or private): Enabling effective social and users participation in planning and operation, fostering the required collaborative framework for social value creation	

- **Setting long-term goals cooperatively:** to avoid short-term action spurred by immediate economic signals.
- **Surpassing the ideological liberalisation bias:** the pursuit of liberalisation has often overlooked the social value of renewable energy deployment. As more countries in the Global South demonstrate the capacity to deploy RE without full liberalisation, examples should be championed.
- **International collaboration to share governance structures:** by sharing insights on governance and societal involvement, international collaboration can help countries navigate the complexities of energy market structures.
- **Championing long-term PPAs as a new procurement mechanism:** Countries around the world are procuring RE (and flexibility services) with long-term PPA, surpassing the idea of auctions as subsidies. These examples should be normalized and mainstreamed in the international discussion.





# Thank you!



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