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THE MARKETING AND CALCULATION OF GAS TRANSMISSION CAPACITY IN THE EU

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Disclaimer

This paper explores issues currently being analysed, and builds upon insights already reached by the CEER Task Force „Capacity ", chaired by C. Cuijpers. As such, it benefited substantially from the work ongoing within this task force.

The views expressed are those of the authors and do not necessarily reflect the opinions of the Council of European Energy Regulators or the Commission for Regulation of Electricity and Gas.

The paper does not prejudice any decisions that CEER or CREG may take in the future or the results of any public consultation that is undertaken on these issues

Outline

- Link with Liberalisation
- Link with Security of Supply
- What is available gas transmission capacity?
- How to calculate?
- Standard firm: trade-off reliability/quantity trade-off
- Extension of Force Majeure

Market unbundling

Link with liberalisation

Upstream:
- Production + gas treatment
- Liquifaction + LNG shipping
- Operational storage
- Upstream pipelines

High pressure system:
- Transmission
- Storage
- LNG reception
- Linepack & flexibility

Market for transport services: primary & secondary market

Distribution:
- Low pressure pipelines
- Metering (of consumption) and data reconciliation
- Odorisation

Supply:
+ Shipper's activity
+ Trading
+ Whosesale, retail

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Link with liberalisation

Obligation on the Transmission Service Operator (TSO)

- to meet reasonable market demand
- to offer all the available capacity (on the primary market)
- to publish the figures of available capacity

Regulator has to check:

- that capacities are published
- that the figures are reliable

Which approach is adequate from a regulatory/competition point of view?

- there are no industry-wide standards at the moment
- depending on how the available capacities are calculated: congestion
  ⇨ barrier to entry for new suppliers

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Link with Security of Supply (SoS)

Traditional approach

Government
↓
Public Service Obligations or SoS standards

Monopolist
↓
No penalties if firm supply is disrupted

Future « Market Culture »

Supplier

Buyer

Supply contract:

high penalty for interruption of firm supply = SoS

Shipper

TSO

Transmission contract:

penalty for interruption approved by regulator, should reflect the market value for SoS

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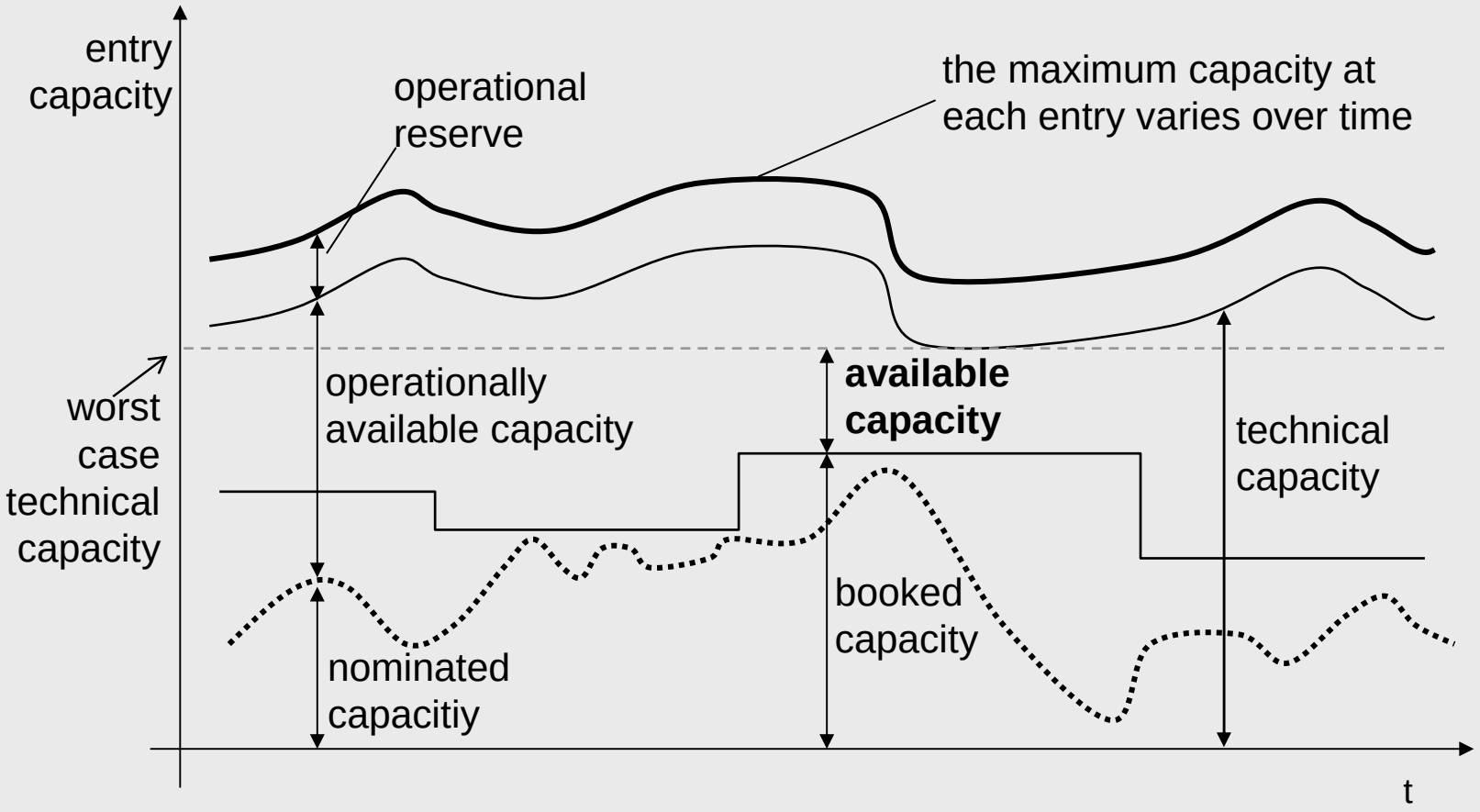
What is available gas transmission capacity?



What is available gas transmission capacity?

The maximum capacity at a given entry point is not constant over time:

Static elements:

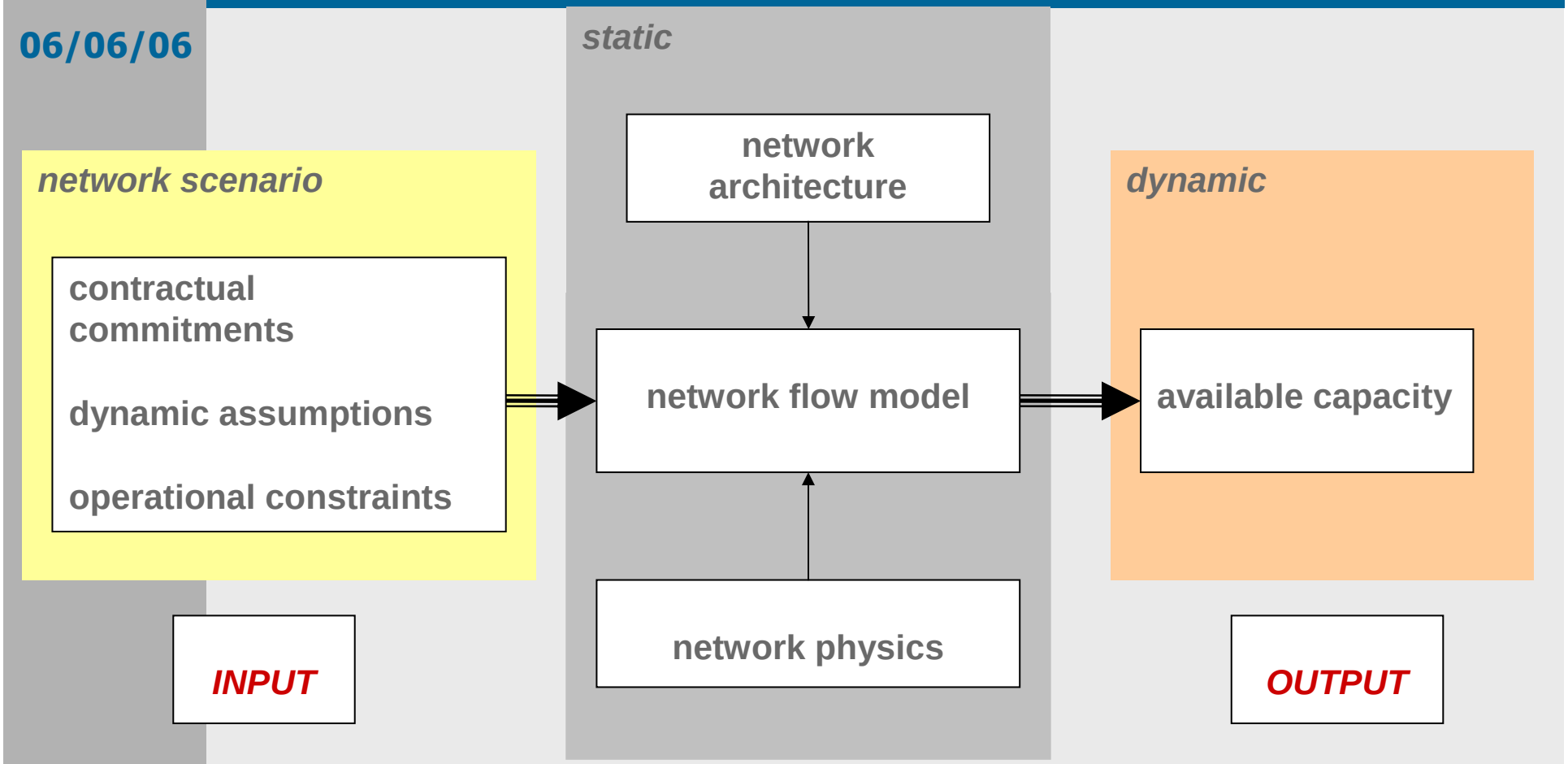
- Pipelines : length, diameter, roughness
- Network configuration
- Equipments: compressors, valves, etc.

Dynamic features:

- distribution of the nominations between the various entry points of the network
- usage of the flexibility services offered by the system operator
- consumers' gas demand at each exit point
- properties of the gas : pressure, temperature, composition
- operating mode of the ancillary equipments by the network operator

Technical capacity: base on worst case scenario

Available capacity = technical capacity – booked firm capacity



available capacities are not absolute but vary in function according to the selected underlying network assumptions

⇓

what you get out of a network model (*available capacities*) is what you put in (*scenario*)

network scenario = contractual commitments + dynamic assumptions + operational constraints

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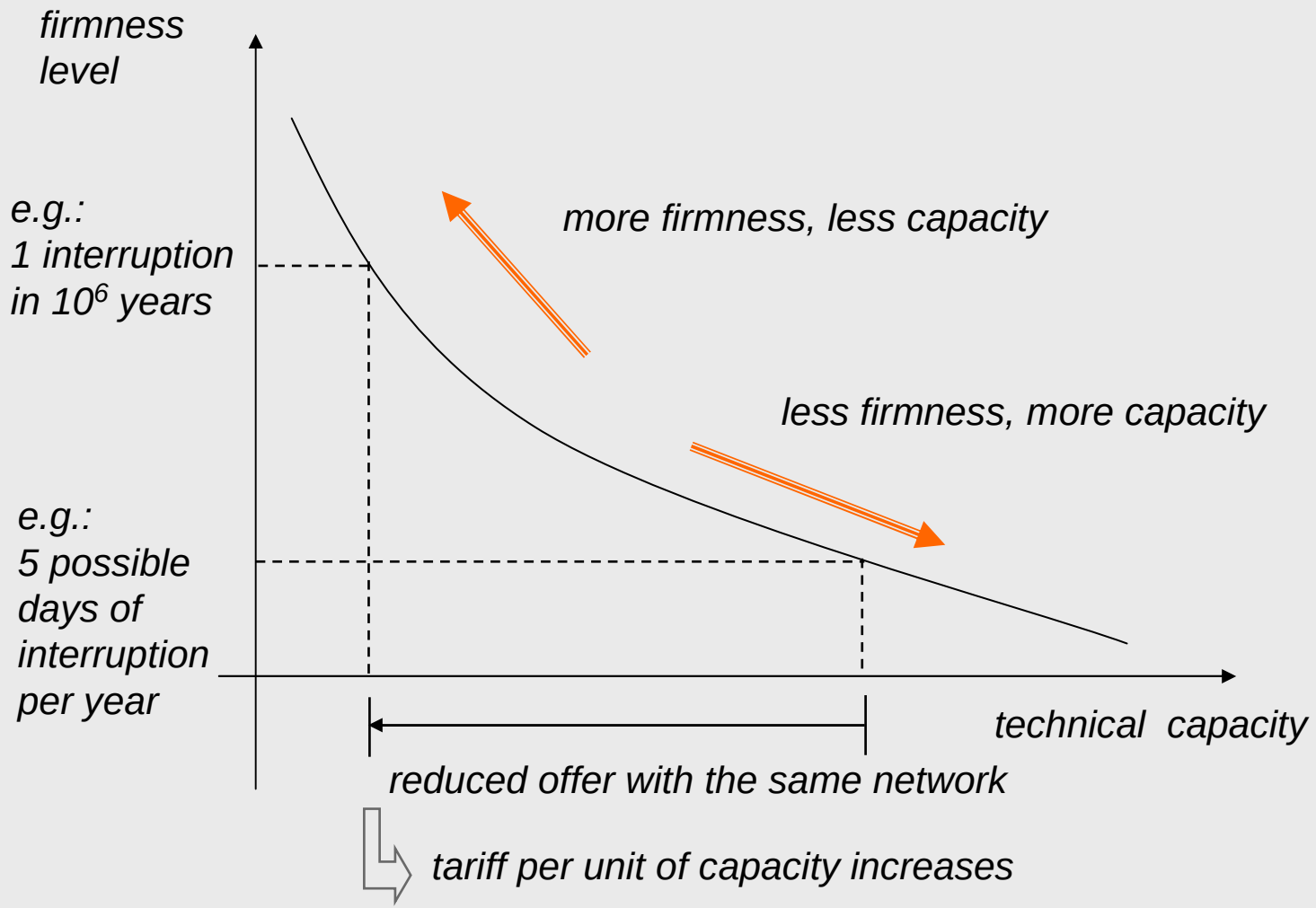
The trade-off between firmness and capacity



The trade-off between firmness and capacity

Force Majeure

= superior or irresistible force that excuses a failure to perform

= failures like e.g. pipeline incidents and "acts of God" that justify a release of responsibility of the TSO

≠ foreseeable events, like maintenance (especially in meshed network)

≠ incidents due to negligence of the TSO (including lack of investment)

= also behavioural Force Majeure situations: unrealistic behaviour of market players (unlikely scenarios)

Scenario building

network flow assumptions	legal standard or observed worst case
off-take by households and offices	1 in 20 years peak day consumption (temperature related)
off-take by power plants	power generation at full capacity in those plants paying for firm capacity; utilisation rate during the day according to observed maximum (extrapolated)
off-take by other consumers	observed highest consumption (extrapolated)
synchronisation of capacity utilisation (among categories of users)	observed worst case (*and not necessarily the assumption that all categories of users nominate their full capacity at the same point in time*)
geographical off-take patterns	for inland exits: extrapolating the existing off-take pattern according to the above assumptions; for cross-border points, the booked capacity
pressure values	observed worst case (*and not necessarily the worst theoretical case based on the contractual lowest inlet and highest outlet pressure)*

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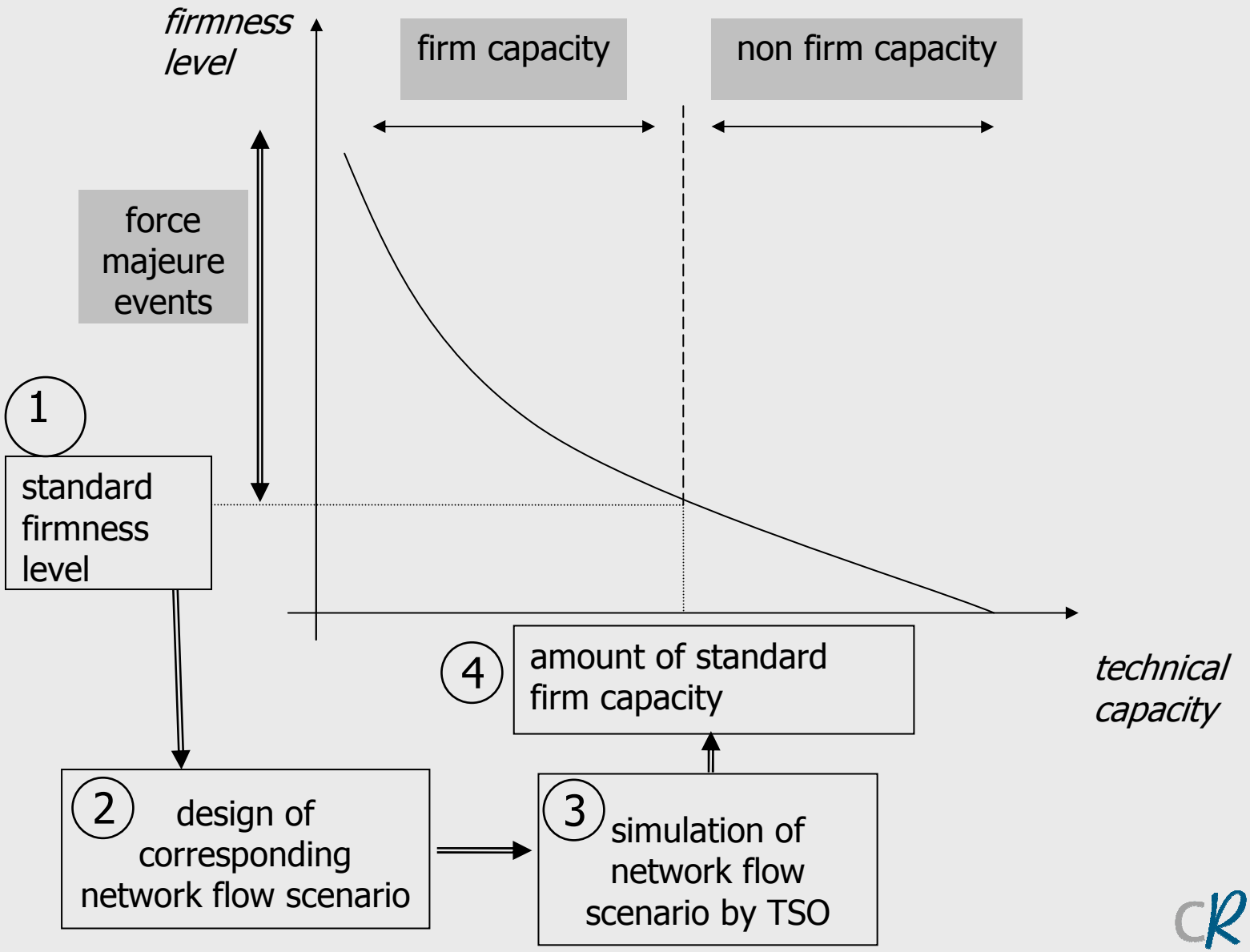
Scenario building

network flow assumptions	**legal standard or observed worst case**
combination of entry flows	- observed worst case, or - (better) the theoretical worst case, combined with a system of « operational options »
operational margin	the amount needed to safeguard system integrity: - coping with imbalances within the balancing period - residual balancing role for the TSO - robustness against a major flow shortfall (to be defined) during 6 hours
availability of storage	-e.g.: if there is an obligation to fill storage by 15 Oct, storage is a firm entry point
Upstream incident	- N-1 principle - otherwise, observed worst case
Etc.	Etc.
sum of assumptions defines a network flow scenario for deriving the amount of standard firm capacity	*product of standards gives the failure risk of standard firm capacity.*

Standard procedure



Conclusion

- Security of supply is not (only) determined by Authority, but ever more based on contractual provisions, including penalties for the deficient supplier
- If transport contracts are to include penalties that reflect the market value for security of supply, the concept of Force majeure acquires a major importance
- (Contractual) congestion is a major barrier to trade in Europe; hence the importance of objective calculation methodologies of available capacity
- Need for more transparency and harmonisation across networks; currently firm capacity has very different meanings in different countries
- Further investigation needed.