

FAST TRANSITIONS, SLOW SOLUTIONS: A FLEXIBILITY TRACKER TO MEASURE PROGRESS

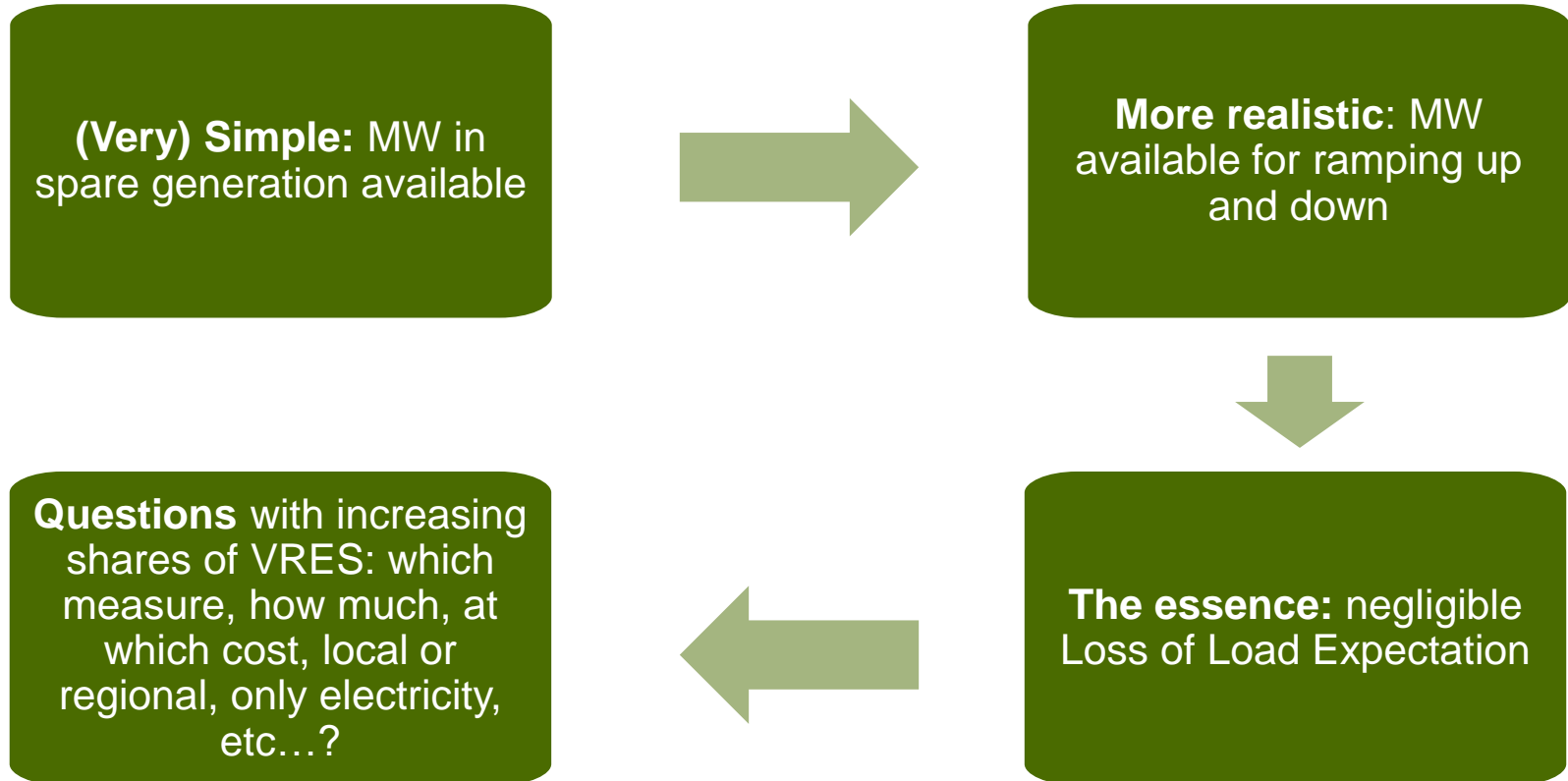
WORKSHOP IEA DSM TASK 17:
RESPONSIVE CONSUMERS AND VALUE
OF FLEXIBILITY

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WE ALL HAVE AN IDEA OF WHAT 'FLEXIBILITY' MEANS AND WHAT OUR END TARGET CAN/SHOULD BE



NOW THE ENERGY TRANSITION ACCELERATES

Norway, Feb 2016: Draft National Transport Plan, in consultation, aims for only zero-emission vehicles (electric or hydrogen) to be sold from 2025.



Netherlands, 2017: Dutch government closes Green Deal regarding zero gas heating for residential buildings.



Germany, 2014-now: Large aluminum producer experimenting with pools of molten Al. and adjustable heat exchangers as virtual batteries.



DEMAND



SUPPLY

INFRA-STRUCTURE



TenneT/Energinet, Mar-2017: Cooperation European Transmission System Operators to develop North Sea Wind Power Hub.



Offshore wind tenders reached new record bids of <60Euro/MWh, down over 50% compared to earlier years

BE, 2018: Energy Pakt looking towards 2030 / 2050 under development



EC, Aug 2017: System Operation Guideline, giving a EU legal basis for Regional Security Coordinators.



GB, March 2015: ITPR sets scene for onshore transmission asset tendering, building on earlier offshore practices.

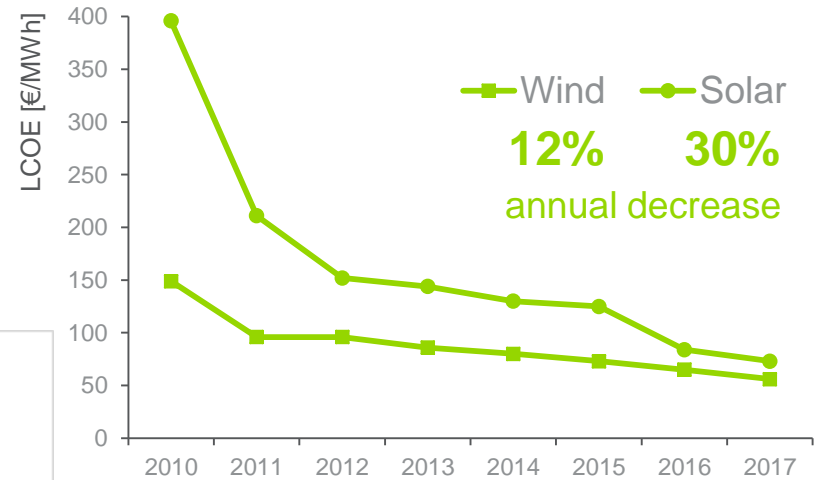


Brussels, 2016: Clean Energy Package pushes for level-playing field for various service providers to compete with assets and conventional players in markets and grid development.

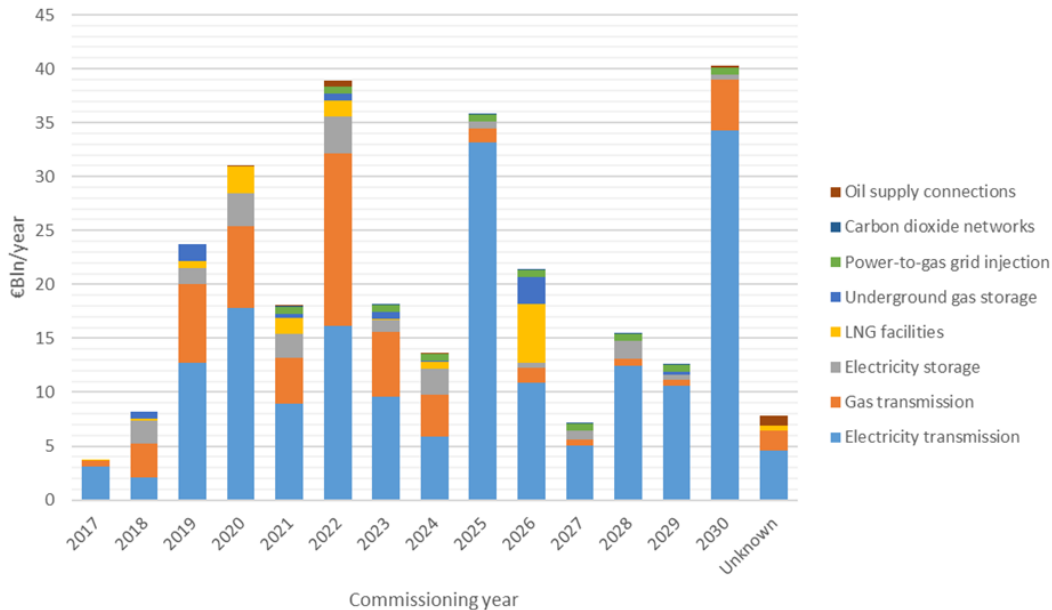
COST AND REVENUE TRENDS RESONATE

RES LCOE KEEPS DROPPING PAST ANY PROJECTIONS

- Moving to zero (direct) subsidies
- Putting pressure on realisation rates and market diversity
- Putting our market thinking to an extreme test



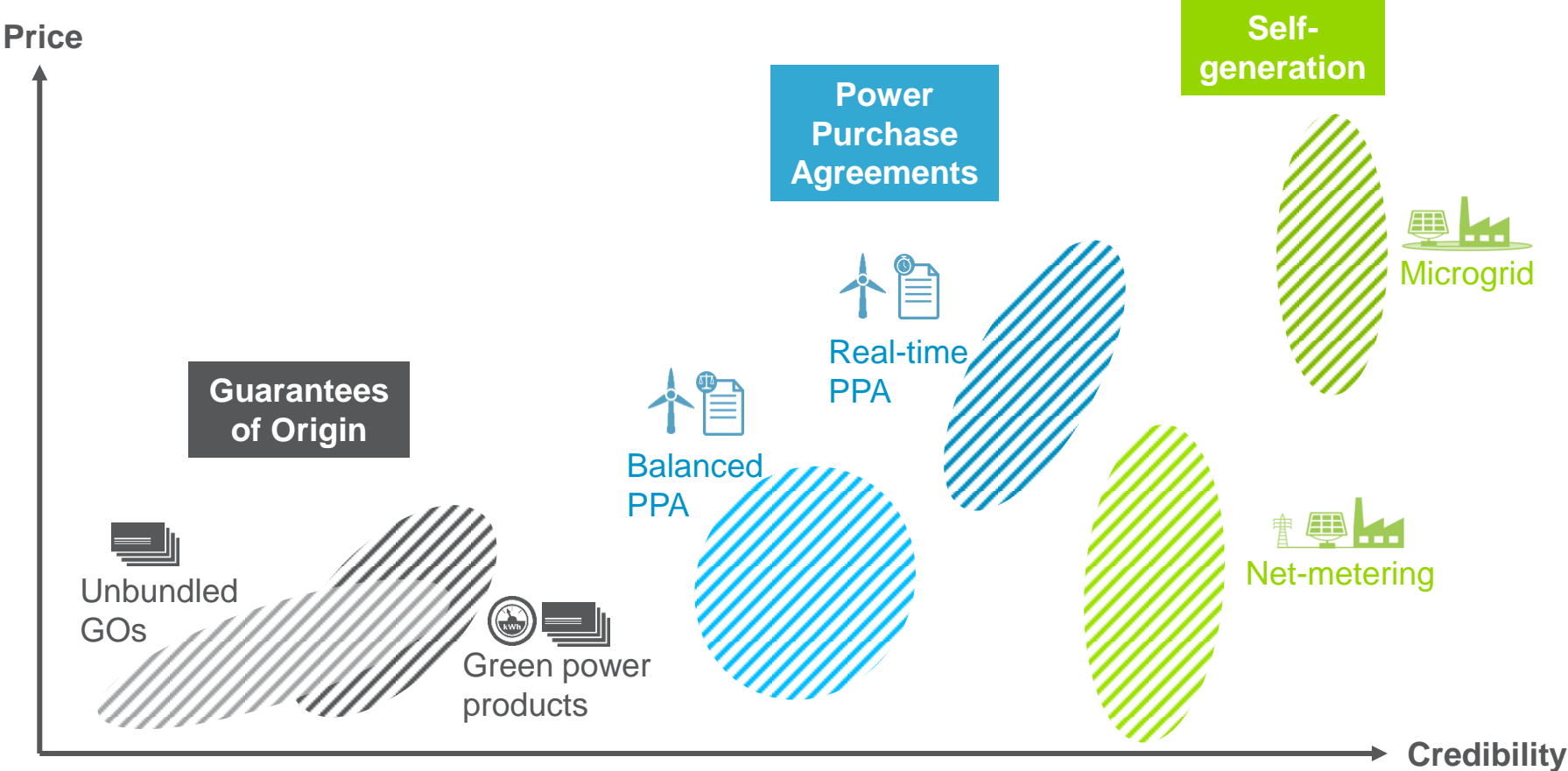
Estimated expenditures per transmission infrastructure type



GRID INFRASTRUCTURE FOLLOWS

- Electricity grids gains, but may face more scrutiny as its relative cost rises
- Gas needs to clarify new value proposition based on sustainable supply and flexibility, if possible

DEMAND IS FINDING EVER NEW OPTIONS



IMPACT OF INCREASING SHARES OF VRES

A FLEXIBILITY GAP CALLS FOR NEW FLEXIBILITY OPTIONS

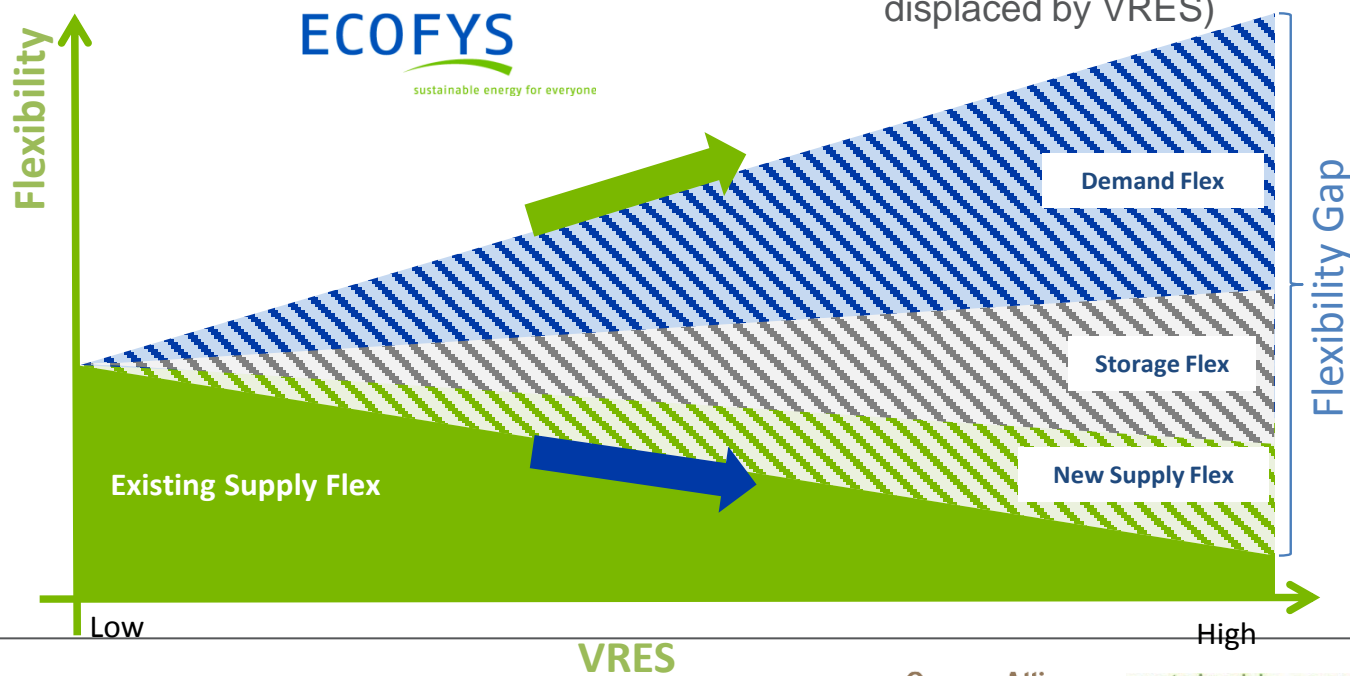
Low VRES

- Flexibility need:
 - Demand variations
 - Supply uncertainty (unit loss)
- Flexibility provision:
 - Supply side (conv. power plants)

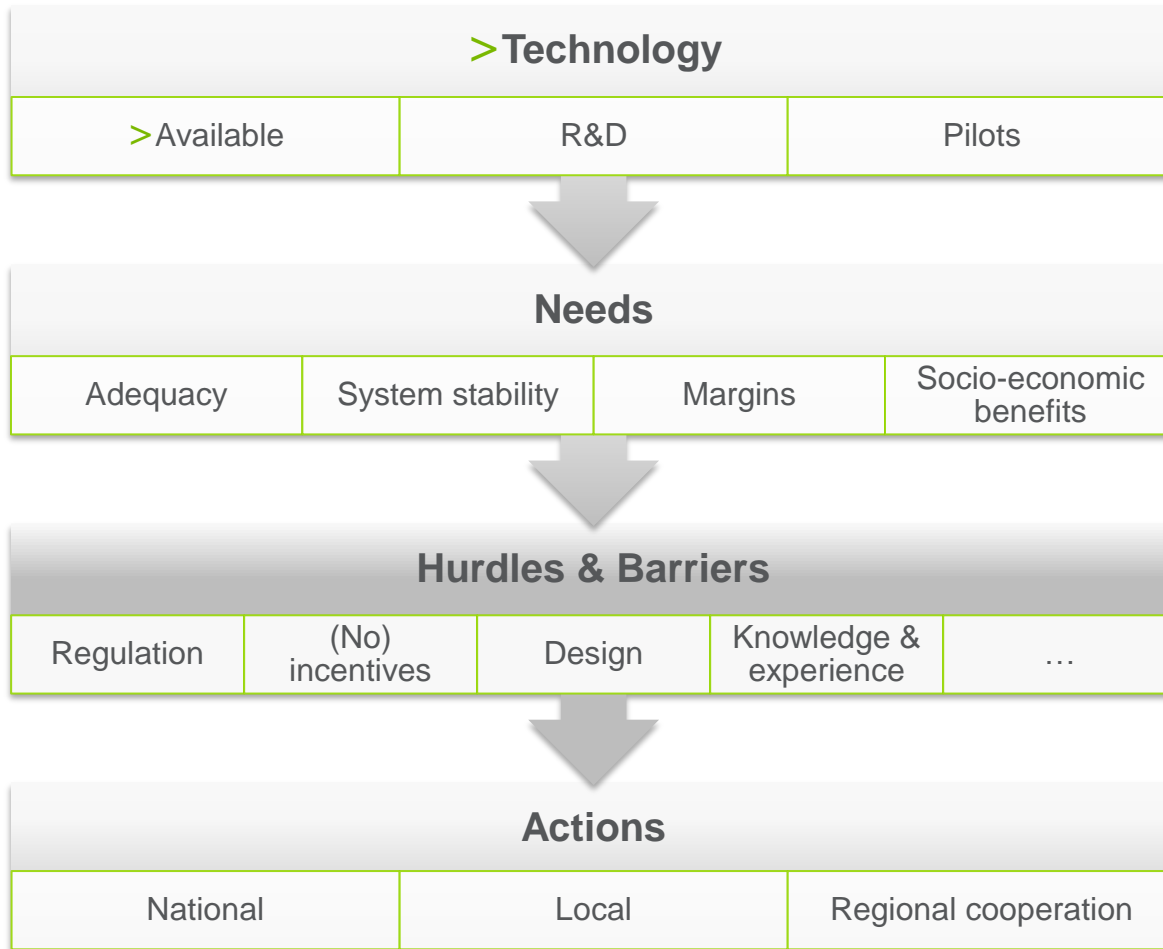


High VRES

- > Flexibility need:
 - Higher (net) demand variations
 - Supply uncertainty (unit loss)
- > Flexibility provision:
 - Lower from supply side (conv. generators displaced by VRES)



HOW DO WE USUALLY TACKLE KEY FLEXIBILITY QUESTIONS?



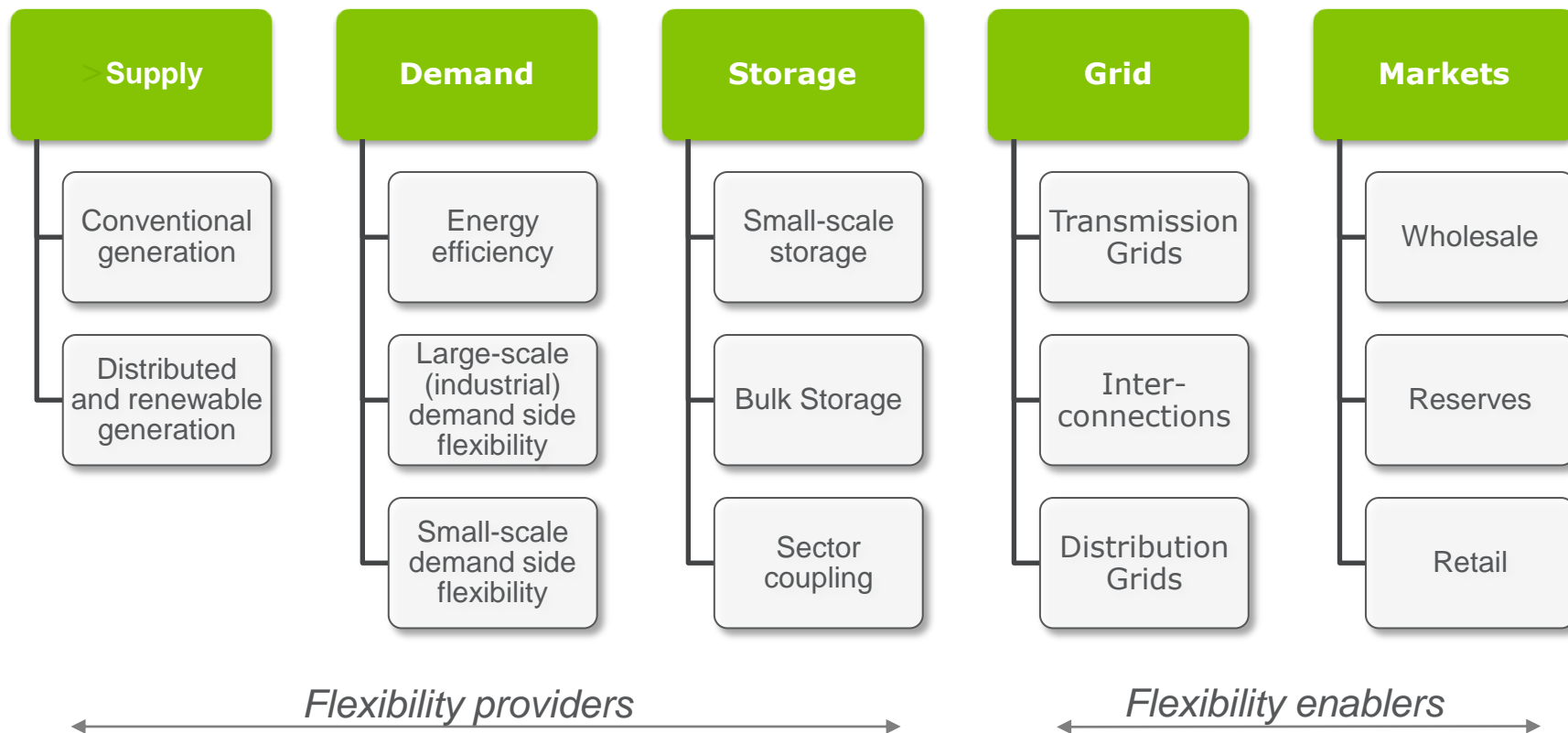
Flexibility Tracker focus

- Monitor
- Compare
- Learn

TOP-DOWN KPI APPROACH

BALANCE COMPLETENESS AND CLARITY

The Flexibility Tracker scores countries on 14 flexibility KPIs based on 80 standardized questions

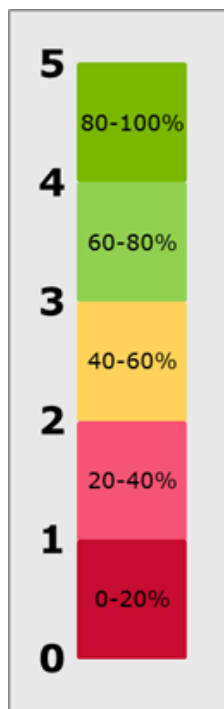


TOP-DOWN KPI APPROACH

THE TRACKER METHODOLOGY

KPI's are presented from one to five

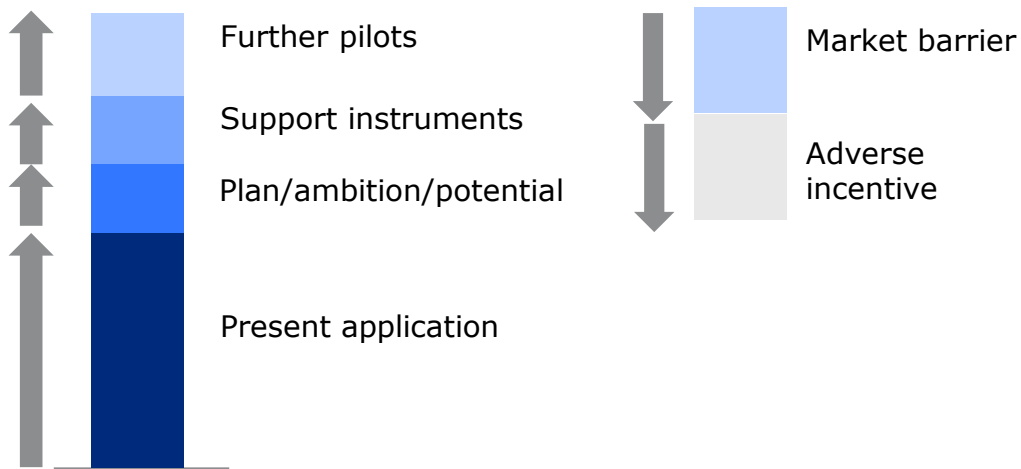
Scores from one (low readiness) to five (high readiness)



Higher score means higher readiness

Higher score can mean amongst others:

- Vaster potential
- More substantial application
- Clearer policy incentives
- More concerted RD&D efforts
- Better awareness/action
- ...and any combination thereof



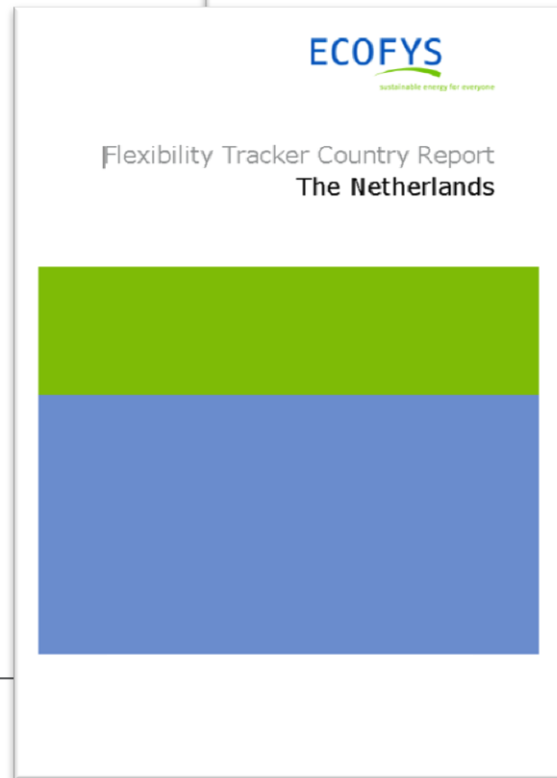
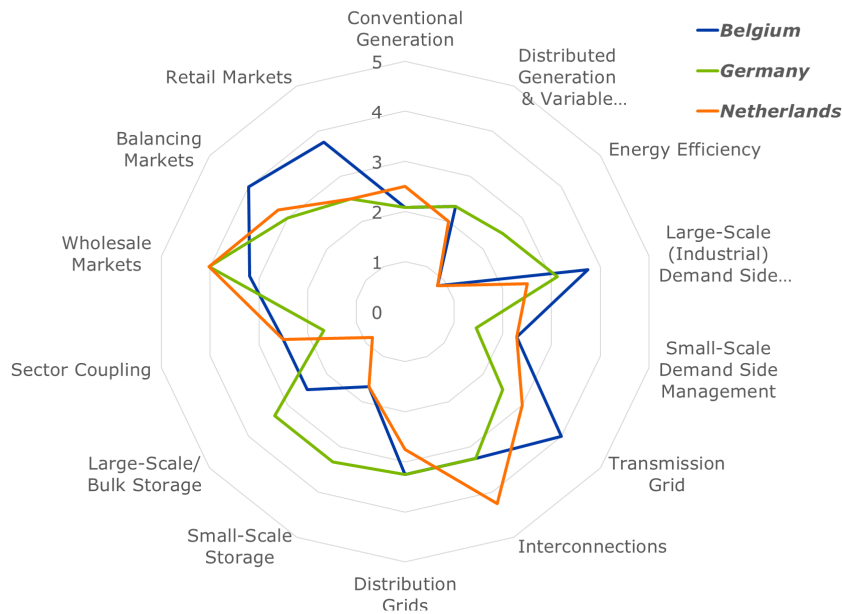
Scope of Flexibility Tracker is important

Flexibility Tracker does not:

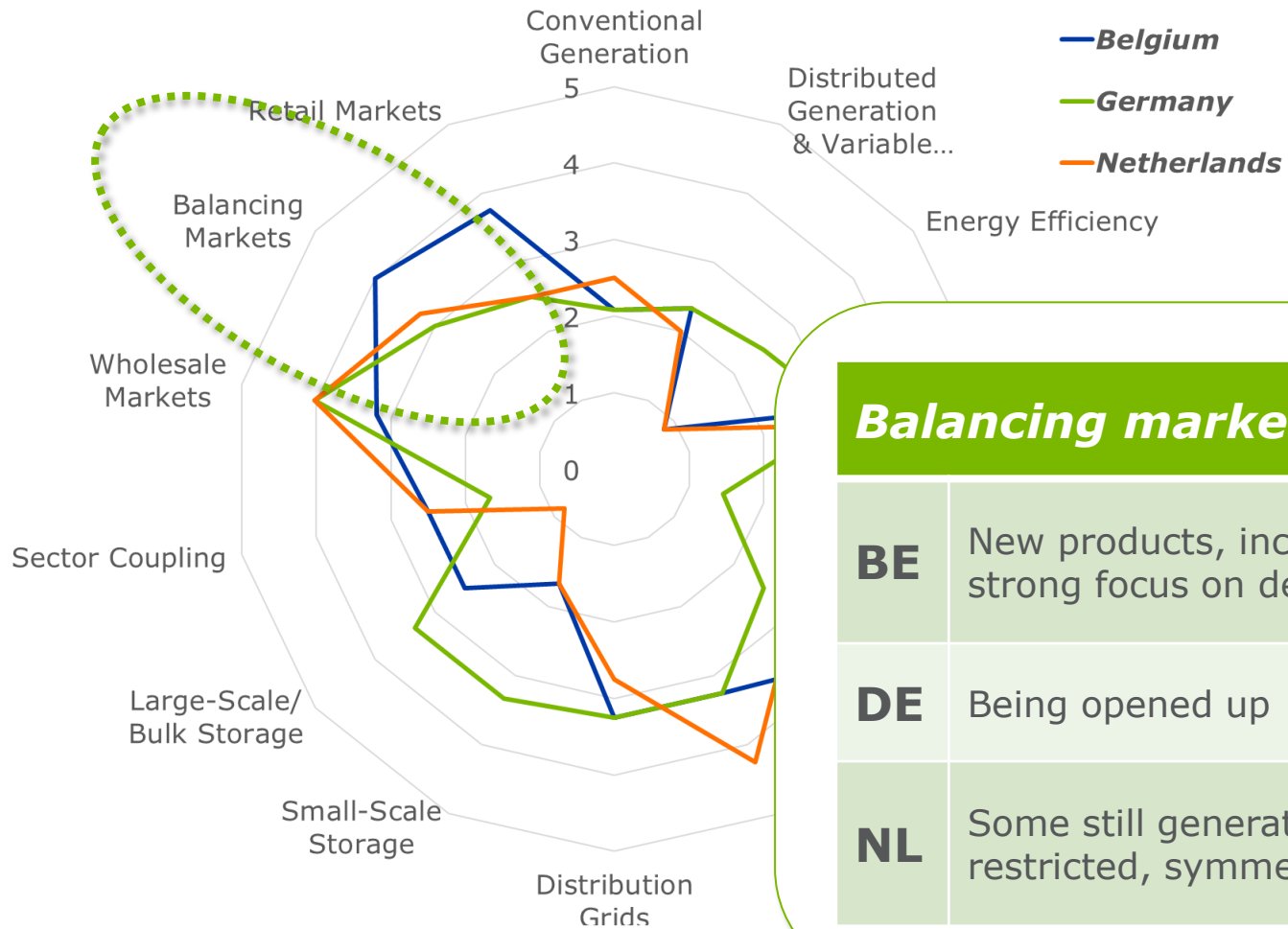
- Score today's or yesterday's flexibility need
- Indicate an optimal (cost-based) balance of solutions
- Assess scenario-specific (e.g. adequacy) issues

SET OF COUNTRY REPORTS

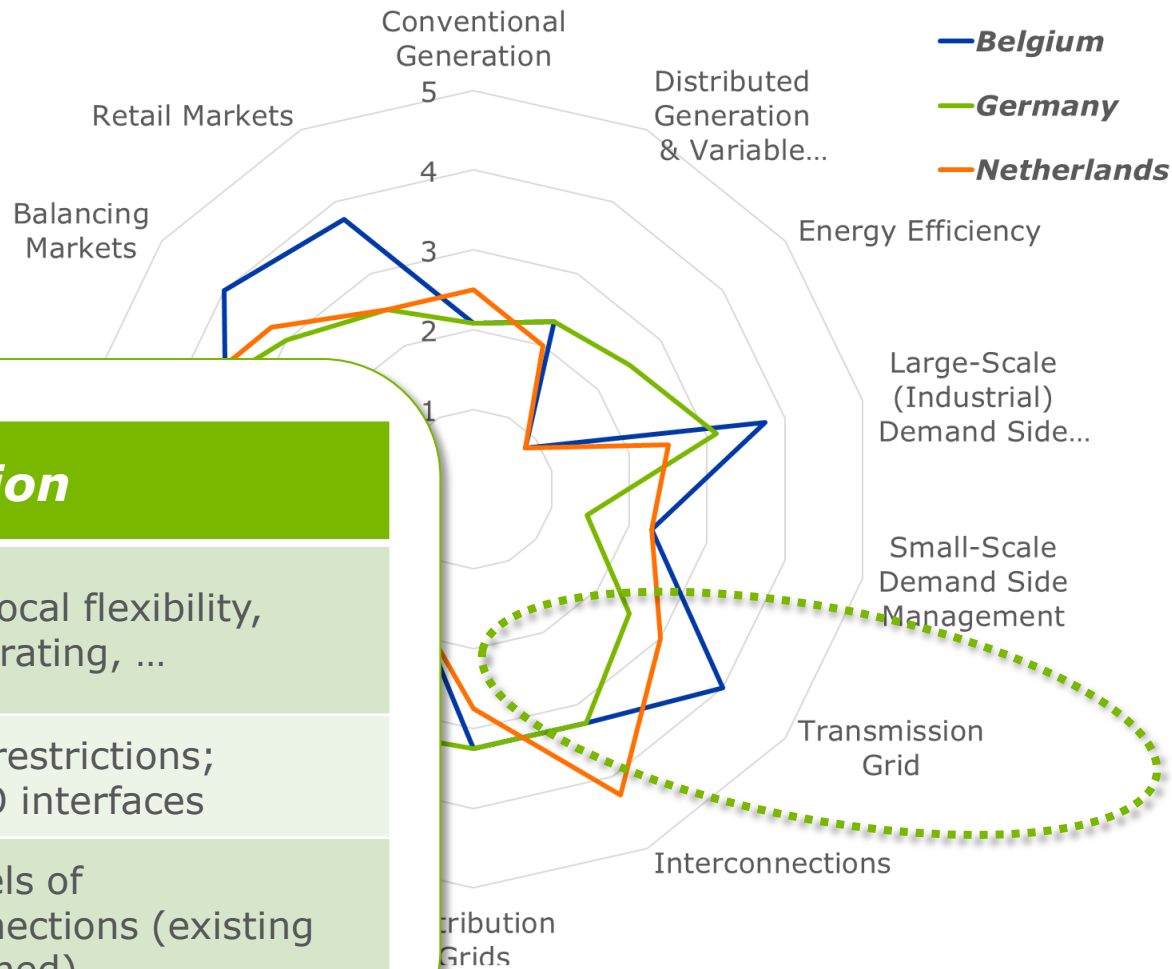
- Fact sheet
- 14 flexibility KPIs and main messages
- Country comparison
- Recommendations for action



SET OF COUNTRY REPORTS



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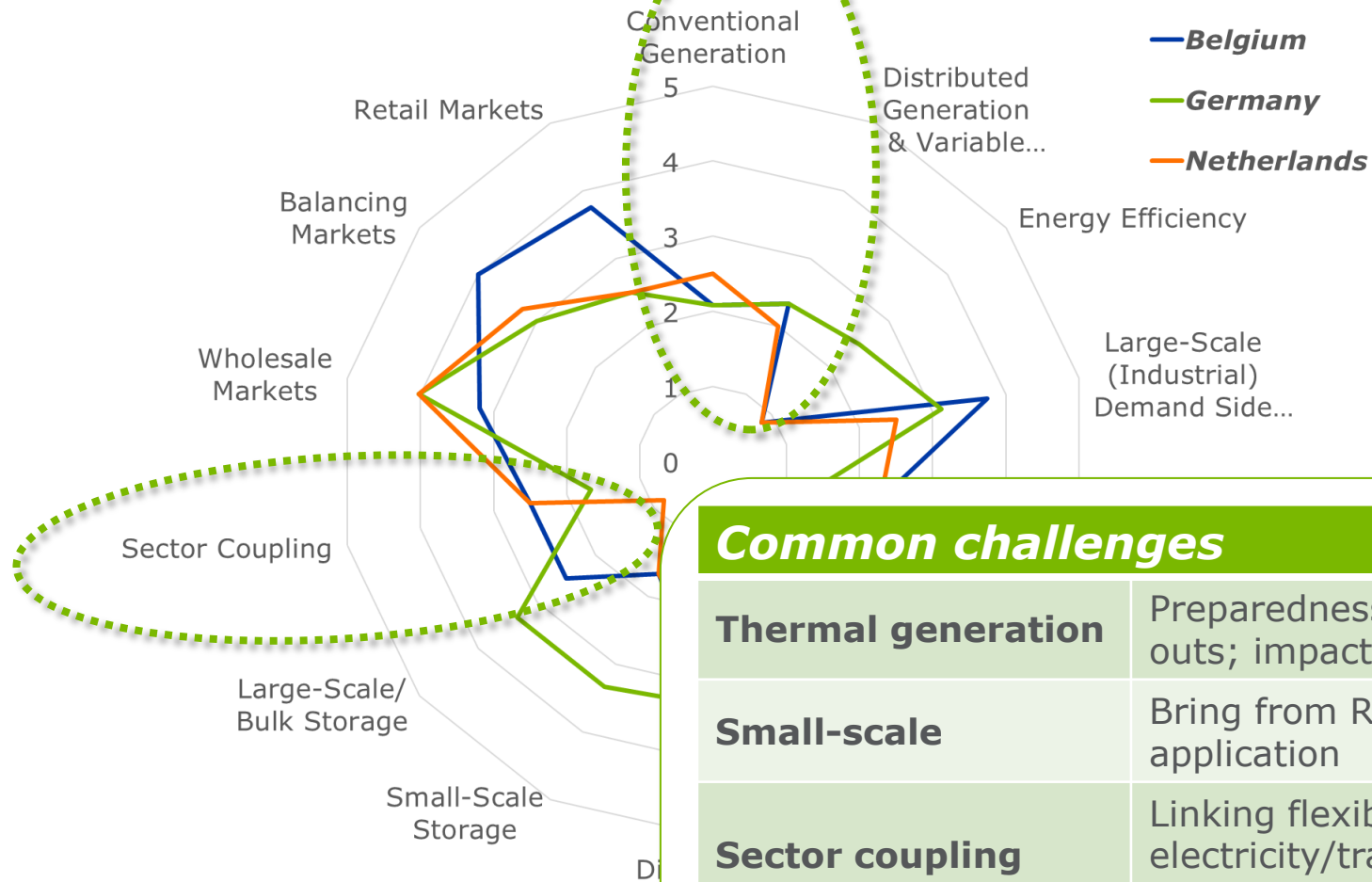
Transmission

BE Tests of local flexibility, dynamic rating, ...

DE Internal restrictions; TSO/DSO interfaces

NL High levels of interconnections (existing and planned)

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Common challenges

Thermal generation

Preparedness for phase-outs; impact of subsidies

Small-scale

Bring from R&D pilots to application

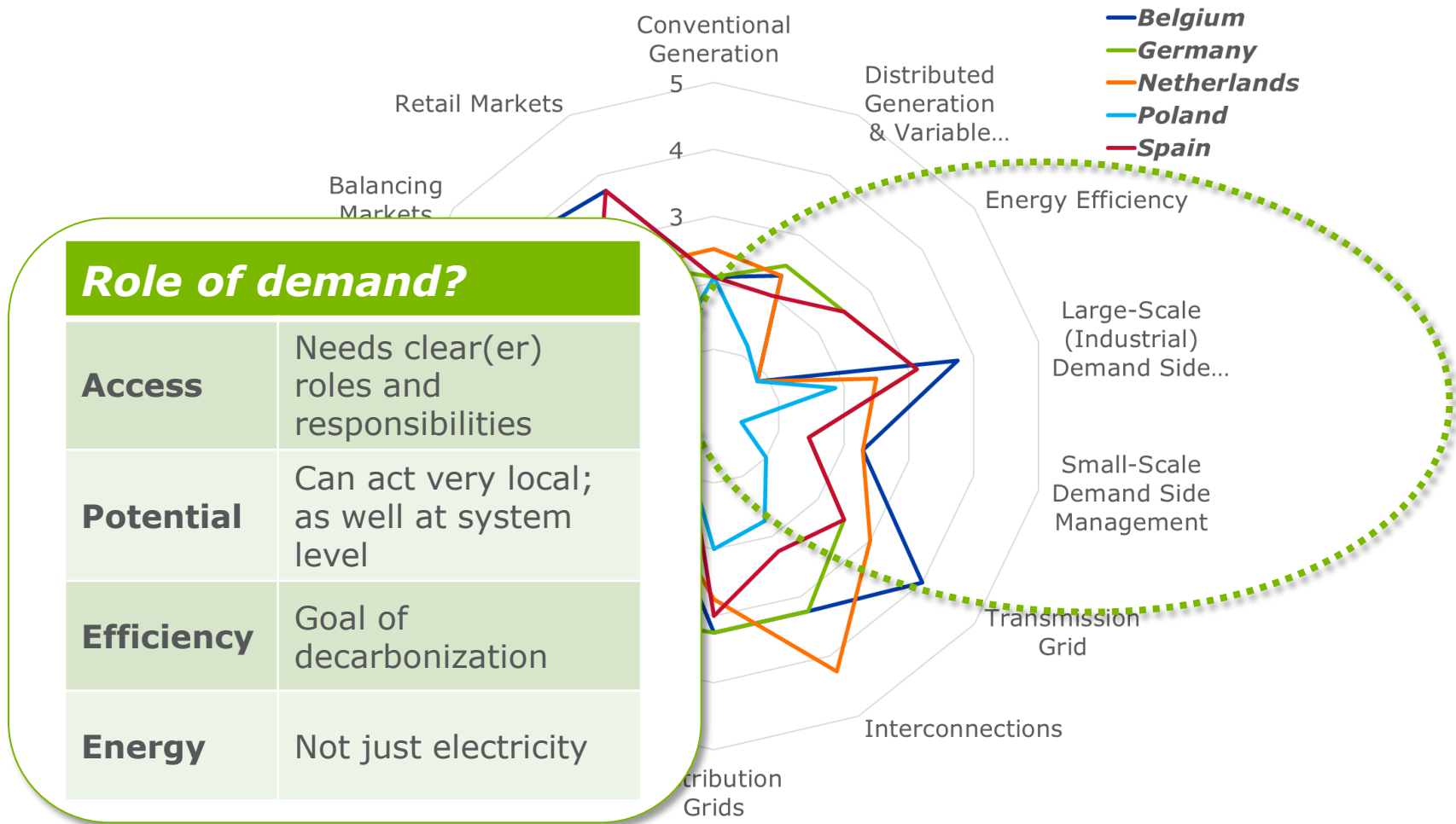
Sector coupling

Linking flexibility of heat/electricity/transport; Power-to-Gas; ...

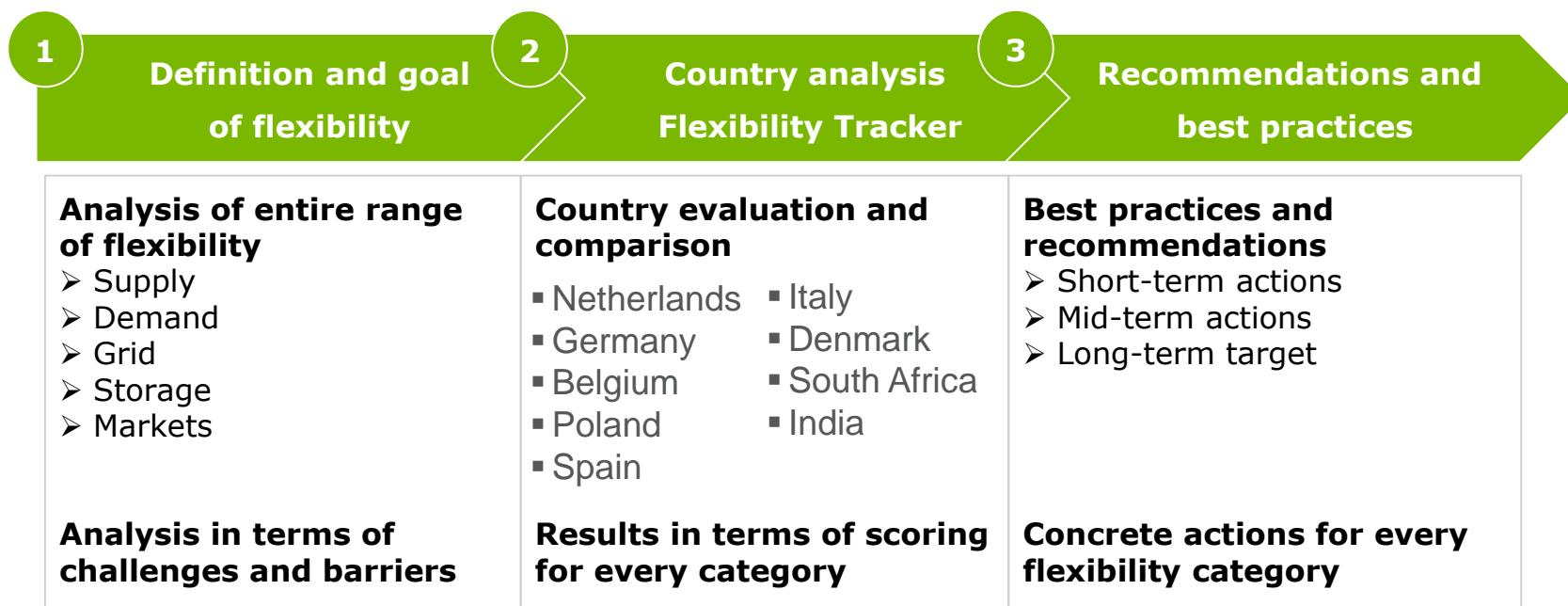
Further regional integration

Pool resources

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UNDERSTANDING TRENDS, NEEDS, BEST PRACTICES



REFERENCES

More information

Leonardo Energy:

<http://www.leonardo-energy.org/>

- Flexibility white papers
- Country Reports for Belgium, Germany, The Netherlands, Poland, Spain, Denmark, Italy available
- More in development



Twitter #EnergyFlexibility

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