

IMPACTS OF THE MIGRATE PROJECT RESULTS AND UPCOMING RECOMMENDATIONS

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AGENDA

1. Impact of MIGRATE project results: can the proposed solutions compete economically with conventional means?
2. Recommendations from the MIGRATE: the upcoming deployment roadmap

ECONOMIC IMPACT OF MIGRATE PROJECT RESULTS



Can the solutions developed in the project compete economically with existing, more traditional means?

→ Compare the costs of alternative „system stability strategies“ for a set of use cases (i.e. a defined time horizon and adequacy scenario; a defined control zone)



ECONOMIC IMPACT OF MIGRATE PROJECT RESULTS

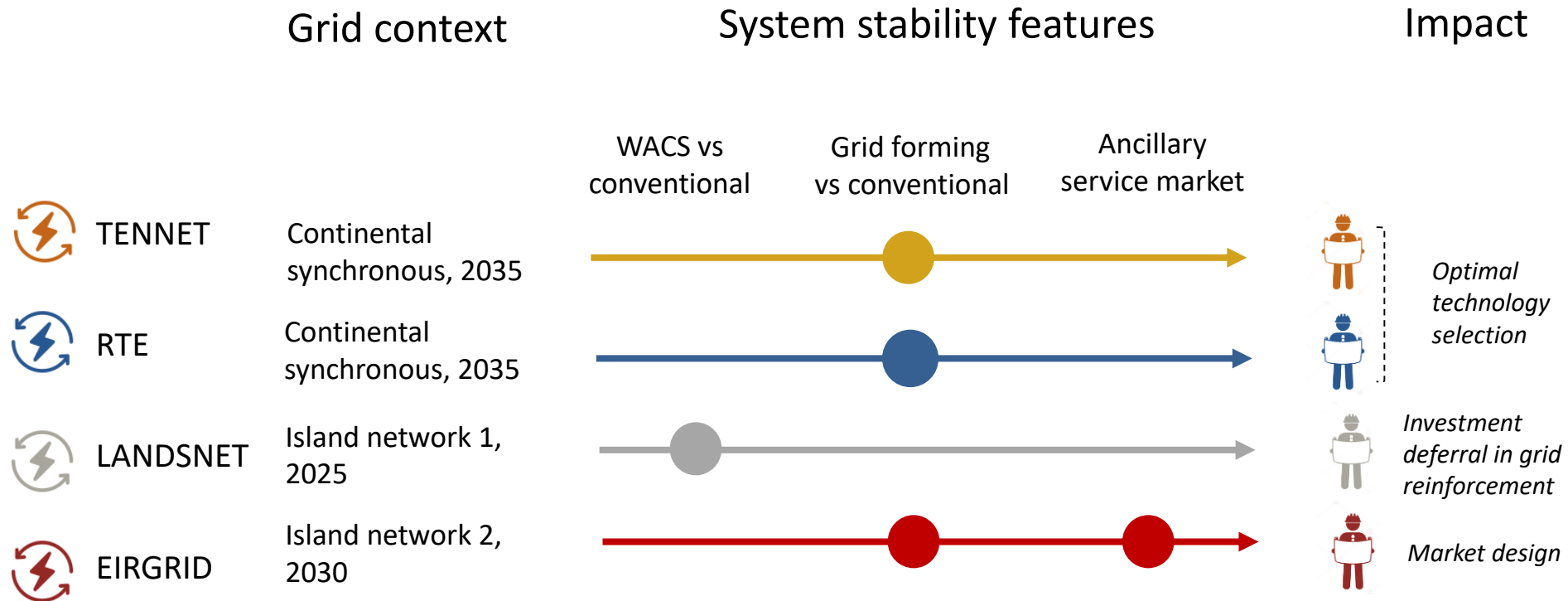
Topics to be investigated



- Compare costs of grid forming vs off the shelf synchronous condensers / turning nuclear power plants (FR) into synchronous condensers
- Economic value of using WACS vs conventional methods to improve system stability by utilizing fast response from controllable resources already available in the Icelandic grid
- How to use system services and define a new market to ancillary services in order to support the grid in terms of stability?

ECONOMIC IMPACT OF MIGRATE PROJECT RESULTS

Use cases



ECONOMIC IMPACT OF MIGRATE PROJECT RESULTS

Methodology

1. Select a scenario by 2025-2035 for each use case, among available adequacy forecast studies

Landsnet 2025



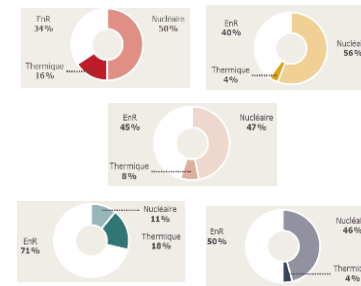
- *Slow Changes*
- *Green Future*
- *Long term >2030*

Eirgrid 2030



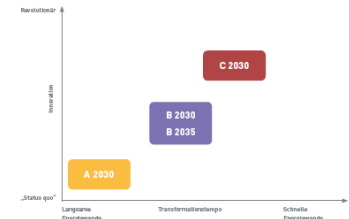
- *Slow Change*
- *Steady evolution*
- *Low carbon living*
- *Consumer action*

RTE 2035



5 scenarios with different paces of nuclear shut down

TENNET 2030



- *Slow energy transition*
- *Transformations*
- *Fast energy turnaround*

ECONOMIC IMPACT OF MIGRATE PROJECT RESULTS

Methodology

2. Characterize the different *stability strategies* to be compared

Example on RTE use case

“Low tech” Strategy a)

Grid forming ensured by the alternators of the shut-down nuclear plants (used as synchronous condensers)

“Low tech” Strategy b)

Grid forming ensured by off-the shelf synchronous condensers

“New regulation” Strategy

Grid forming ensured by the inverter controllers of the RES power plants connected at transmission level, according to new grid connection codes

ECONOMIC IMPACT OF MIGRATE PROJECT RESULTS

Methodology

3. Set data requirements for economic comparison, using ENTSO-E CBA approach as a starting point
4. Collect and process data using assumptions based on:

- MIGRATE results:

e.g. Hypothesis of 30% grid forming inverters

- External sources of information:

e.g. CAPEX/OPEX of synchronous condensers:

- *70 M€ for 500 MVar (source Ansaldo Energia)*
- *Loss 1-3% of the rated power (source ABB)*

ECONOMIC IMPACT OF MIGRATE PROJECT RESULTS

Release of results



Confidential Deliverable D6.3 due June 2019



Dissemination S2 2019

AGENDA

1. Impact of MIGRATE project results: can the proposed solutions compete economically with conventional means?
2. Recommendations from the MIGRATE: the upcoming deployment roadmap

UPCOMING RECOMMENDATIONS

MIGRATE Deployment roadmap – public deliverable



D1.6

Recos to clarify requirements in connection codes and to test compliance of PE units

D2.5

Recos on the use of synchronized measurements

D3.6

Requirement guidelines for generating units in 100% PE systems

D5.5

Mitigation of PQ disturbances

D6.3

Impact analysis

D4.5

Power system design for a secure system under high PE

Analysis of barriers to scaling up and replication of MIGRATE solutions

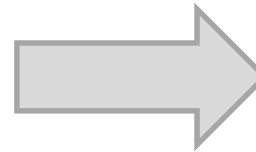


*Questionnaire to Migrate partners
Feedback from external stakeholders*

UPCOMING RECOMMENDATIONS

MIGRATE Deployment roadmap – public deliverable

Rely on proven methodological grounds...



... and feed the 'sectorial' initiatives & roadmaps



REALISEGRID a roadmap for the innovative transmission grid technologies in Europe at 2030-2040 - D1.4.2
<http://realisegrid.rse-web.it/Publications-and-results.asp>



eHighway2050 : planning of the Pan-European Transmission Network, 2020 - 2050, to ensure the reliable delivery of renewable electricity and pan-European market integration
<http://www.e-highway2050.eu/>



Next Implementation plan 2020-2023



Next implementation plan 2020-2023



Working groups

GARPUR: Recommendations and implementation plan for the Design and test of new reliability rules for European electricity transmission networks
<http://www.garpur-project.eu/>

UPCOMING RECOMMENDATIONS

- Illustrative purpose only! -

	Stability knowledge & indicators	Stability monitoring & forecast	Grid forming	Power quality	Protection schemes	
Stability-related Data and models	 Recos  R&D gaps		 Recos  R&D gaps	 Recos  R&D gaps		<i>Towards standardisation</i>
Algo & software		 Recos  R&D gaps			 Recos  R&D gaps	<i>Towards industrialisation</i>
Testing and implementation	 Recos  R&D gaps	 Recos  R&D gaps	 Recos  R&D gaps	 Recos  R&D gaps		<i>Towards large scale integration</i>
Regulation & socio-economic aspects			 Recos  R&D gaps			<i>Towards new rules</i>

UPCOMING RECOMMENDATIONS

to be released in December 2019



THANKS FOR YOUR ATTENTION!



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