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FlexPlan

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# Overview of the FlexPlan Project

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# Agenda

- Motivation of the FlexPlan project
- Achievements of the project
- Project layout
- Overview of the new planning tool
- FlexPlan partnership
- The FlexPlan web

# FlexPlan

- Start date: 01.10.2019
- End date: 30.09.2012
- Short description: FlexPlan aims at establishing **a new grid planning methodology** considering the opportunity to introduce new storage and flexibility resources in electricity transmission and distribution grids as an alternative to building new grid elements

## FlexPlan: motivation

- High-speed deployment of RES (challenging European target: 32% at 2030) is making T&D planning more and more complex and affected by a high level of uncertainty
- Grid investments are capital intensive and the lifetime of transmission infrastructure spans several decades: when a new line is commissioned it might be already partially regarded as a stranded cost
- Building new lines meets more and more hostility from the public opinion, which makes planning activities even longer and affected by uncertainties
- There is an on-going debate on the selection of storage technologies and system flexibility, able to make the overall generation-set behaviour more predictable and schedulable (concept of virtual power plant)
- **Hence the idea of a grid expansion tool for analysing storage and flexibility as alternative to new T&D lines; incentivization procedures could be put in place by the regulators wherever consistent advantages are seen**

# What will FlexPlan achieve?

## 1 – New planning methodology supported by two innovative tools

Creation of a **new tool for optimizing T&D grid planning**, considering the **placement of flexibility elements** located both in transmission and distribution networks **as an alternative to traditional grid planning**: in particular, storage, PEV, demand response)



Additionally: **preliminary assessment** to assess:

- limitations in flexibility and storage capabilities,
- what services could be requested,
- what costs (CAPEX/OPEX)
- what the optimal sizing and siting within the European system.

This will bring to **build up a pre-processor** able to locate candidate storage facilities and flexible resources to be analysed by the new planning tool in parallel to new T&D Lines.

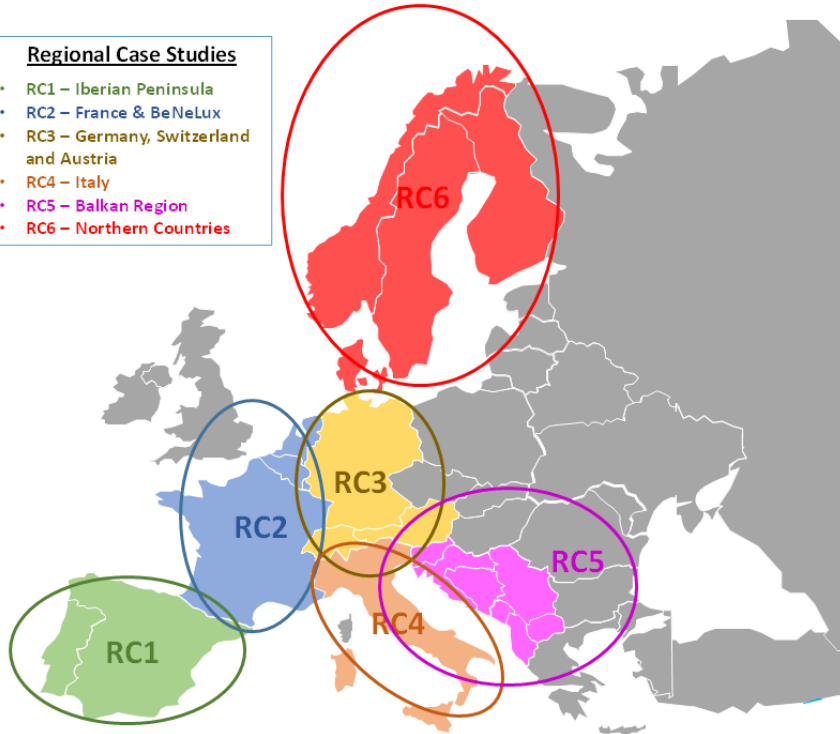
# What will FlexPlan achieve?

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## 2 –Regulatory guidelines supported by 2030-40-50 scenario analysis

### Regional Case Studies

- RC1 – Iberian Peninsula
- RC2 – France & BeNeLux
- RC3 – Germany, Switzerland and Austria
- RC4 – Italy
- RC5 – Balkan Region
- RC6 – Northern Countries



The new planning methodology will be applied to analyse **scenarios at 2030-2040-2050** in order to draw **regulatory conclusions**:

- pan-European scenario with smart nodes equivalents
- six detailed regional cases (T&D)

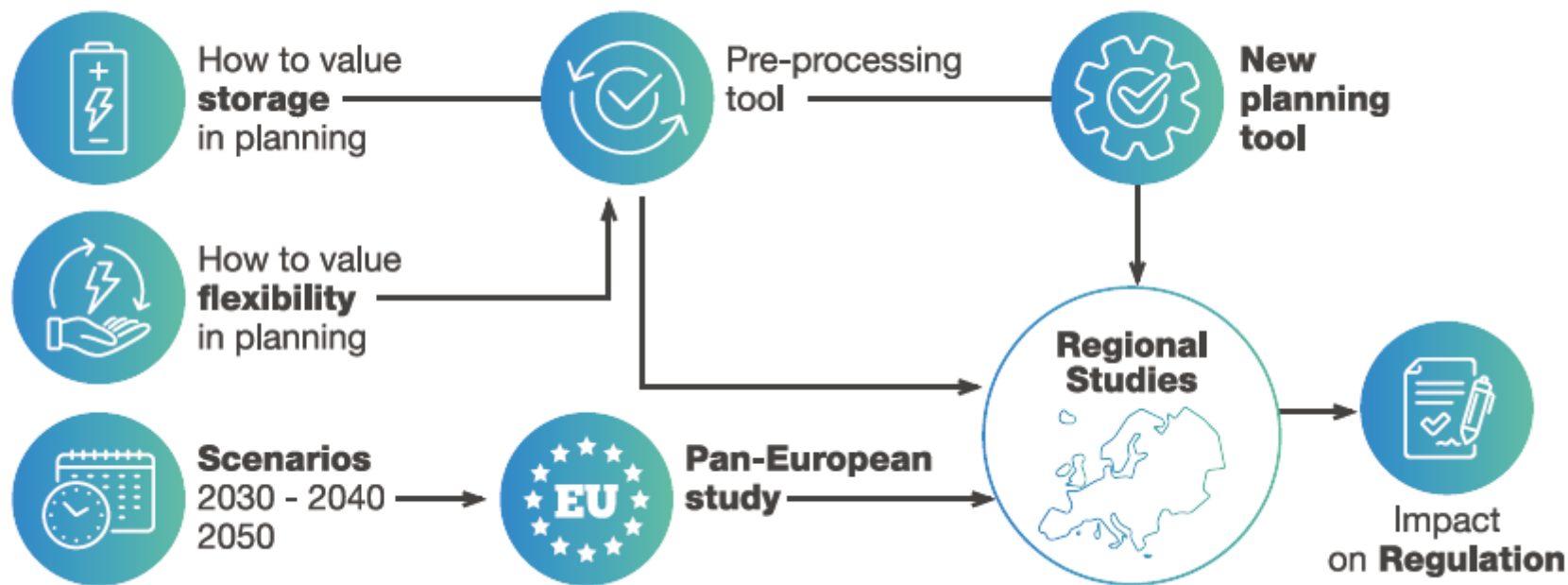
The pan-European scenario will deliver border conditions to initialize in a coherent way the 6 regional cases.

Finally, the analysis of the results of the 6 regional cases will allow to draw:

- Guidelines on an optimized planning methodology for the future usage of TSOs/DSOs
- Indications on the potential role of flexibility and storage as a support to T&D planning
- Regulatory guidelines on opportune incentivization programs

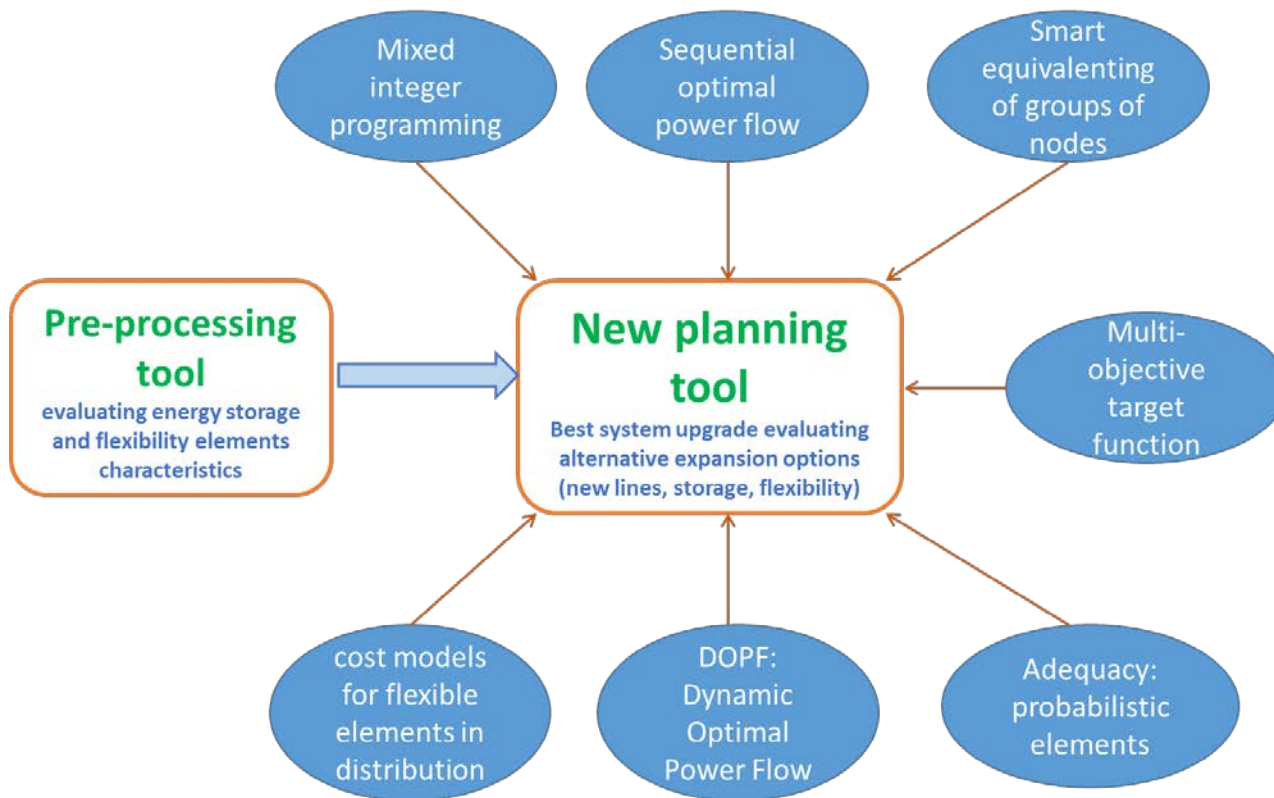
## FlexPlan: overall project layout

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# Overview of the new planning tool

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- Best planning strategy with a limited number of expansion options (mixed-integer, sequential OPF)
- Strategy for extending the planning over several decades (DOPF)
- Probabilistic elements (instead of N-1 security criterion)
- OPF target function open to different criteria introducing CBA elements in loop
- T&D integrated planning
- Embedded environmental analysis (air quality, carbon footprint, landscape constraints)



# FlexPlan: partnership

## • Research Partners:

- RSE, Italy (Project Coordinator, WP7 and WP8 leader)
- EKC, Serbia
- KU-Leuven, Belgium (WP1 leader)
- N-SIDE, Belgium (WP3 leader)
- R&D NESTER Portugal (WP5 leader)
- SINTEF, Norway (WP6 leader)
- TECNALIA, Spain (WP2 leader)
- TU-Dortmund, Germany (WP4 leader)
- VITO, Belgium

## • Transmission System Operators:

- TERN, Italy
  - Terna Rete Italia as Linked third Party
- REN, Portugal
- ELES, Slovenia

## • Distribution System Operators

- ENEL Global Infrastructure and Networks
  - e-distribuzione as Linked third Party



WP1 - Advanced planning tool specifications (KU Leuven)

WP2 - Analysis of capabilities and operation of storage and flexible demand at target years (TECNALIA)

WP3 - Tool implementation and testing (N-SIDE)

WP4 - Pan-European scenarios at target years (TU Dortmund)

WP5 - Regional cases and assessment of advantages over traditional planning (R&D NESTER)

WP6 - Regulatory Analysis (SINTEF)

## The FlexPlan web



- The official web site of the SmartNet project is: <https://flexplan-project.eu/>  
All project news and other information are posted there
- Project brochure can be downloaded from: [https://flexplan-project.eu/wp-content/uploads/2020/02/FlexPlan\\_brochure.pdf](https://flexplan-project.eu/wp-content/uploads/2020/02/FlexPlan_brochure.pdf)
- All project publications (deliverables, papers, important presentations) are publicly downloadable from: <https://flexplan-project.eu/publications/>

# Thank you...

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[FlexPlan-Project.eu](http://FlexPlan-Project.eu)

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