



Norwegian University of
Science and Technology

Horizon 2020 innovation project INVADE

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Scope of the INVAD E project

- **INVAD E:** Smart system of renewable energy storage based on **IN**tegrated **EV**s and **bA**tteries to empower mobile, **D**istributed and centralised **E**nergy storage in the distribution grid
- **OUTCOME:** A cloud-based flexibility management system integrated with EVs and battery storages at mobile, distributed and centralized levels
- **IMPACT:** Utilize renewable energy more effectively, optimizing the supply of electricity and making services more end-user-centric.
 - improves congestion management in the European power grid
 - avoids expensive investments in grid capacity
 - lowers European consumer energy bills

INVADE Background

- Budget: 16 M€
- Coordinator: Smart Innovation Østfold - SIØ
- Work Programme: Secure, Clean and Efficient Energy
 - Supports the transition to a reliable, sustainable and competitive energy system
- Call-topic: Demonstration of smart grid, storage and system integration technologies with increasing share of renewables: distribution system (LCE-02-2016)
 - TRL between 5 and 8
 - Large scale pilots

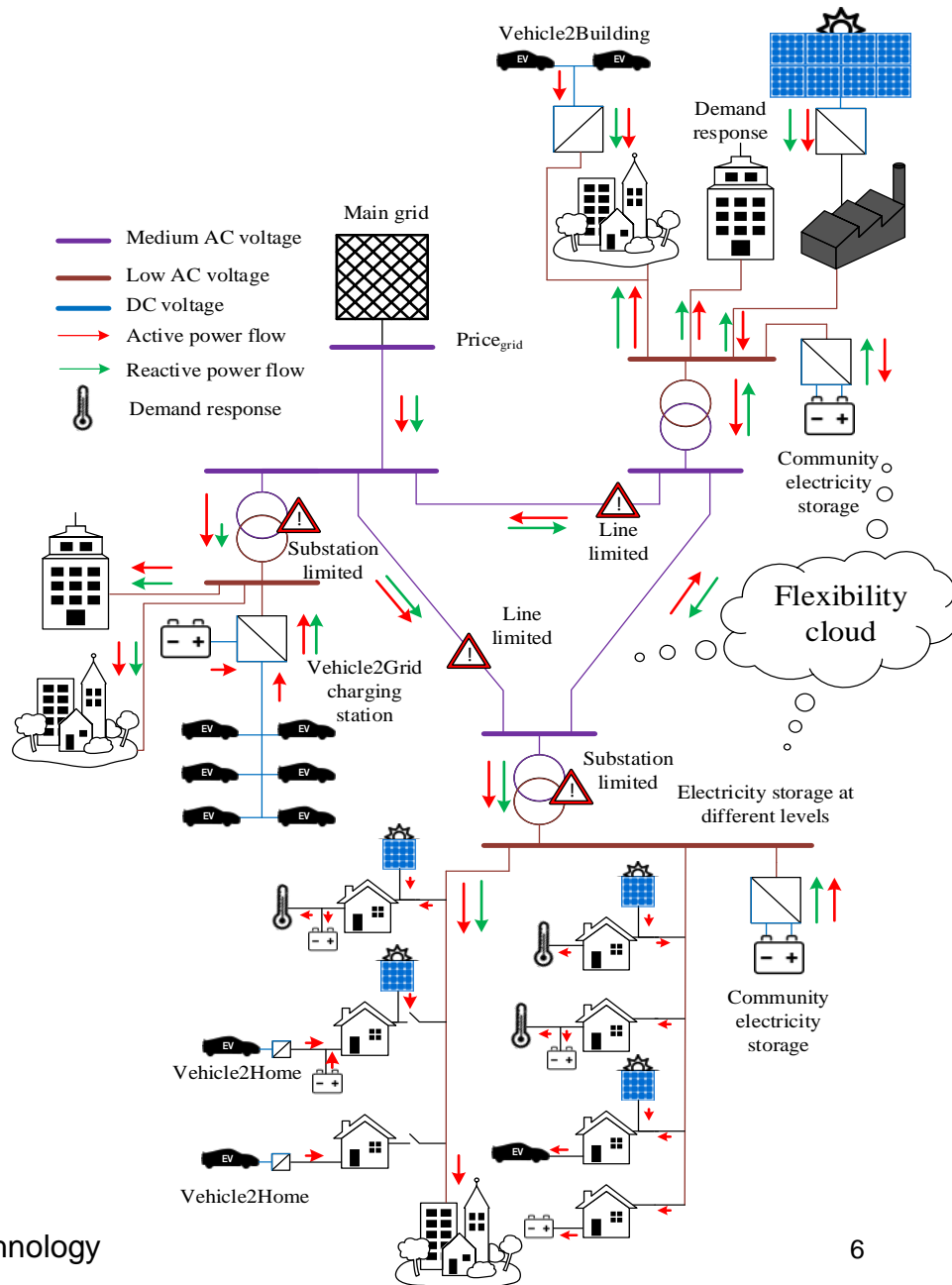
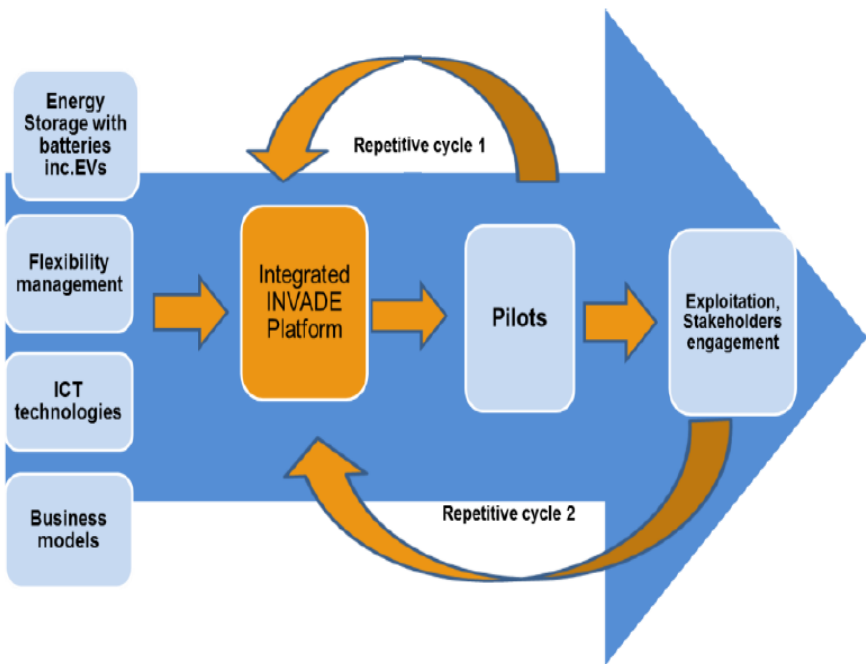
Contribution to overall EU impacts

- The EU power network will be capable of integrating large share of renewables exceeding 50% by 2030 in a stable and secure way
- EU based companies will be able to deliver adequate competitive product and services on the market in 2-5 years after project end
- The demonstrated solutions have the potential to be scaled and replicated

INVADE Consortium

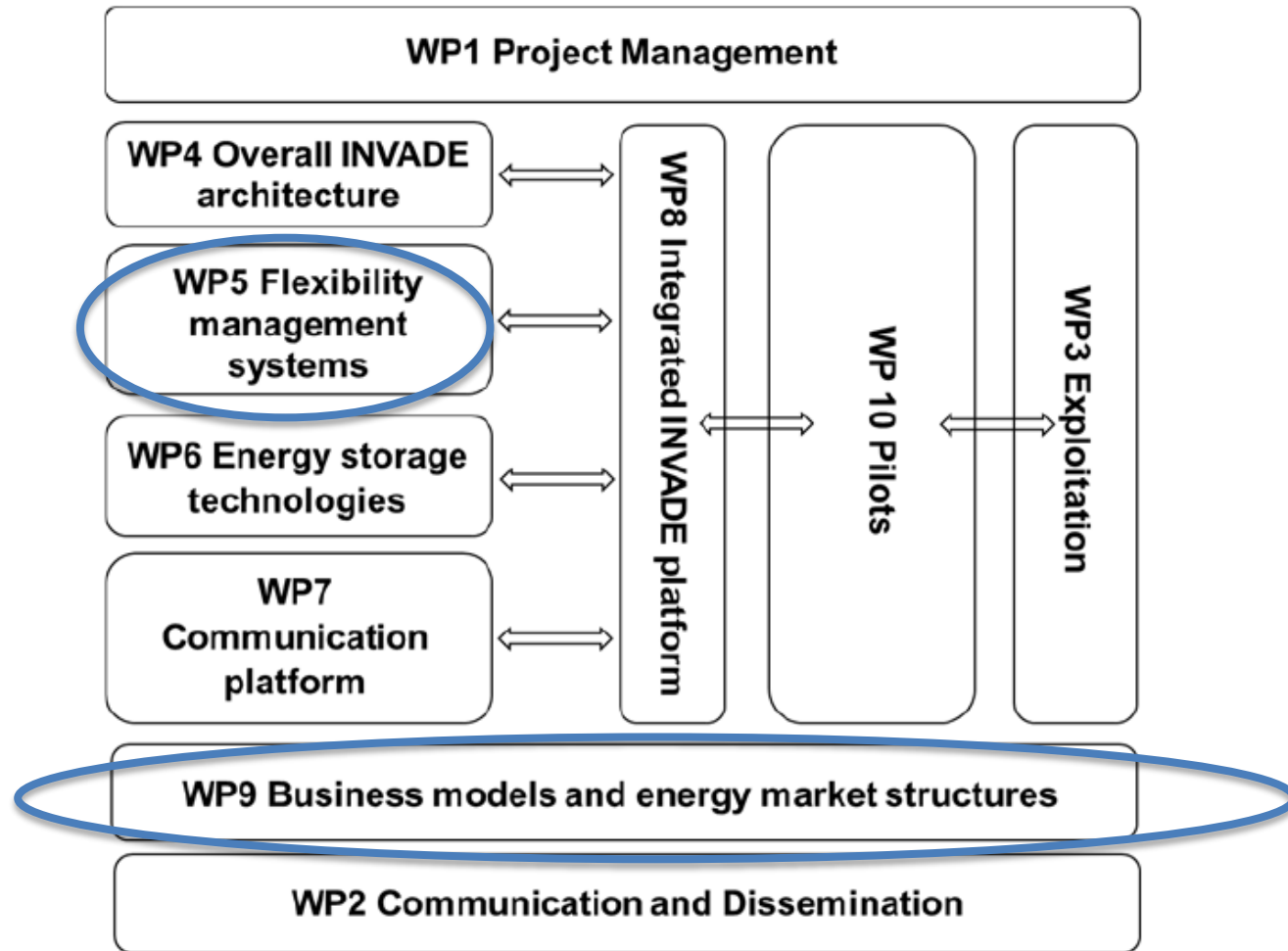


INVADE structure



INVADE Stakeholders

INVADE WP structure



NTNU main activities in INVADE

- Leading WP5: Flexibility Management System
 - 2 Post Docs + hours for Prof/Ass prof
 - Power Systems Group, Dept. of Electric Power Engineering
 - Prof Magnus Korpås, Ass Prof Hossein Farahmand
- Task-leader in WP 9: Business models and energy market structures
 - 1 Post Doc on "User practises and behaviour analysis"
 - Centre for technology and society, Department of Interdisciplinary Studies of Culture
 - Prof Marianne Ryghaug, Senior research scientist Tomas Moe Skjølsvold, PhD William Throndsen

INVADE and related activities



FME CINELDI “Centre for intelligent electricity distribution- to empower the future Smart Grid”

FME ZEN «Zero Emission Neighborhoods»



ModFlex «Modelling of flexible resources in smart distribution grid»

ChargeFlex «Increased Grid Capacity for EVs»



INVADE



EERA JP Smart Grids, Sub-program on Energy Storage