

# ***Program razvoja pametnih omrežij v Sloveniji*** ***Smart Grids Development Program in Slovenia***

AlpStore Summer school Ljubljana

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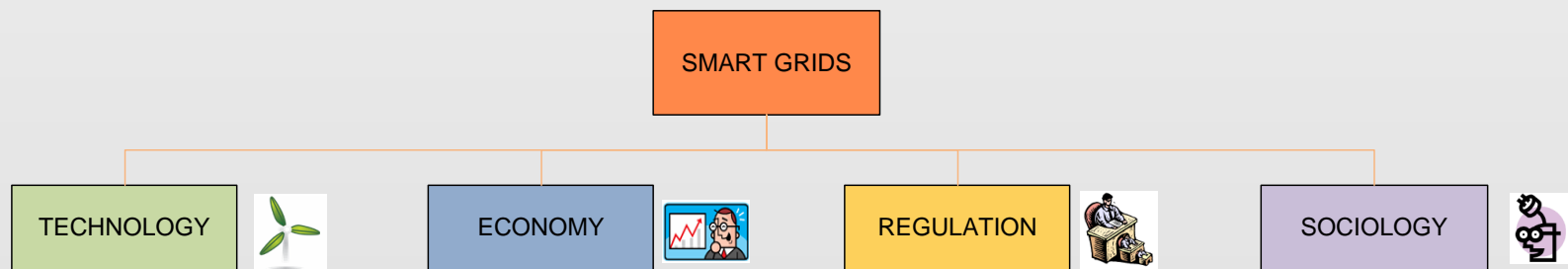
University of Ljubljana, Faculty of Electrical Engineering

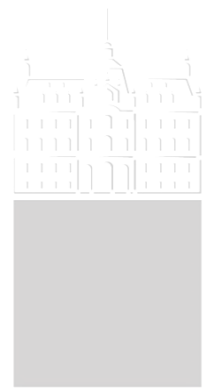
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# Koncept aktivnega – pametnega omrežja

## Active network concept – Smart Grids

- pametno omrežje je več kot samo vključevanje razpršenih virov
- Smart Grids are more than just interconnection of DER
- pametno omrežje omogoča sistemsko učinkovito rabo energije (ne samo pri končnih odjemalcih)
- Smart Grids enable efficient use of energy at the system level (not just at end-users)
- globalni koncept / global concept

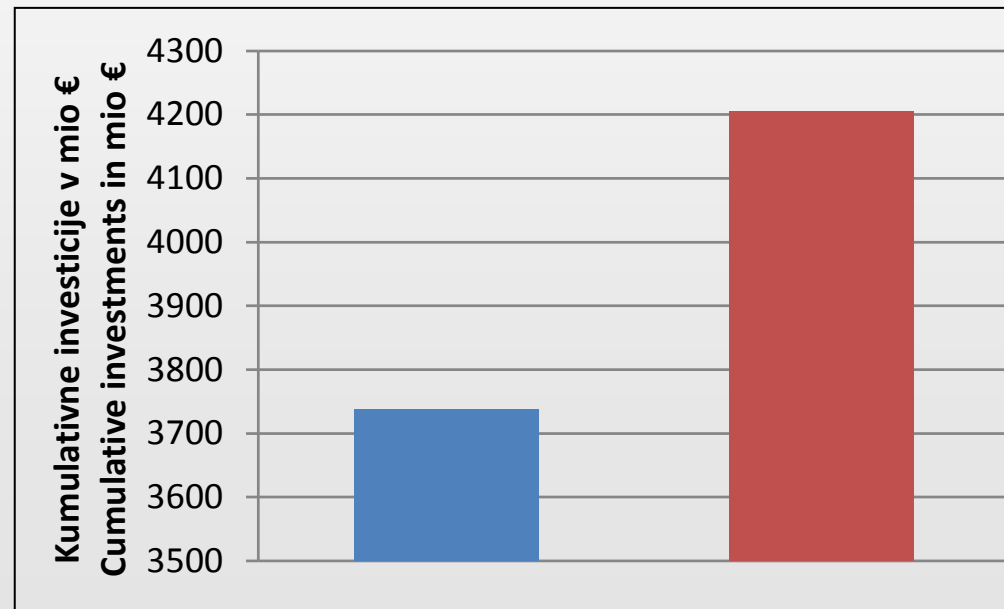




# Dolgoročni učinki

## Long-term effects

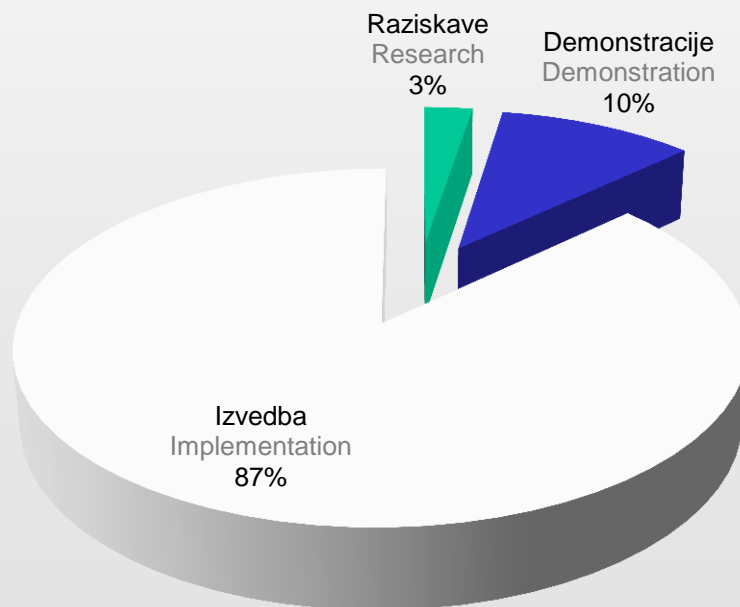
- razlika med kumulativnimi vlaganji v omrežje do 2030 brez (rdeča) in z naložbami v pametna omrežja (modra)
- difference between cumulative network investments till 2030 without (red) and with Smart Grids investments (blue)



# Financiranje do 2020

## Financing till 2020

- po razvojnem scenariju moramo za pametna distribucijska omrežja do 2020 investirati vsaj 320 milijonov €
- according to development scenario we have to invest in distribution Smart Grids at least € 320 million till 2020



# Stanje na področju novih tehnologij

## State-of-the-Art of new technologies

	Tehnologija Technology	Sociologija Sociology	Ekonomija Economy	Regulativa Legislation
Napredno merjenje AMI	✓	○	✓	○
Upravljanje s porabo Demand Response	✓	○	○	✗
Virtualne elektrarne Virtual Power Plants	✓	○	○	✗
Regulacija napetosti Voltage regulation	✓	○	○	✗
Hranilniki električne energije Energy storage systems	○	✗	✗	✗
Infrastruktura za električna vozila EV infrastructure	○	✗	✗	✗



# Foreseen project clusters and goals

- advanced measurement of household consumers
  - 50% lower cost of meter reading, 50% lower cost of commercial losses
- active management of consumption and generation
  - 5% lower system peak load
- modern concepts of interconnection and operation of RES
  - 50% lower investment cost of RES interconnection
- quality management
  - 20% lower investment cost for power quality assurance
- active management of EV infrastructure
  - 50% lower peak load of EV charging
- islanding operation
- all together over 120 project proposals in the national plan

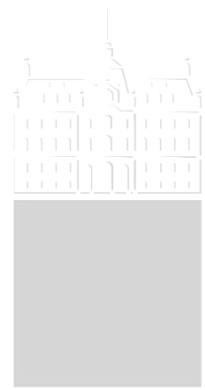
# Operational plan – main focus

	Technology	Sociology	Economy	Legislation
<b>Metering</b>	✓	○	✓	○
<b>Demand response</b>	✓	○	○	✗
<b>Virtual power plant</b>	✓	○	○	✗
<b>Voltage regulation</b>	✓	○	○	✗
<b>Energy storage</b>	○	✗	✗	✗
<b>E-mobility infrastructure</b>	○	✗	✗	✗

# Operational plan – locations







***The next logical step in the coming decades is large scale use of Energy Storage!***