НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ

Application of Smart Grid Introduction International Practice in Russia

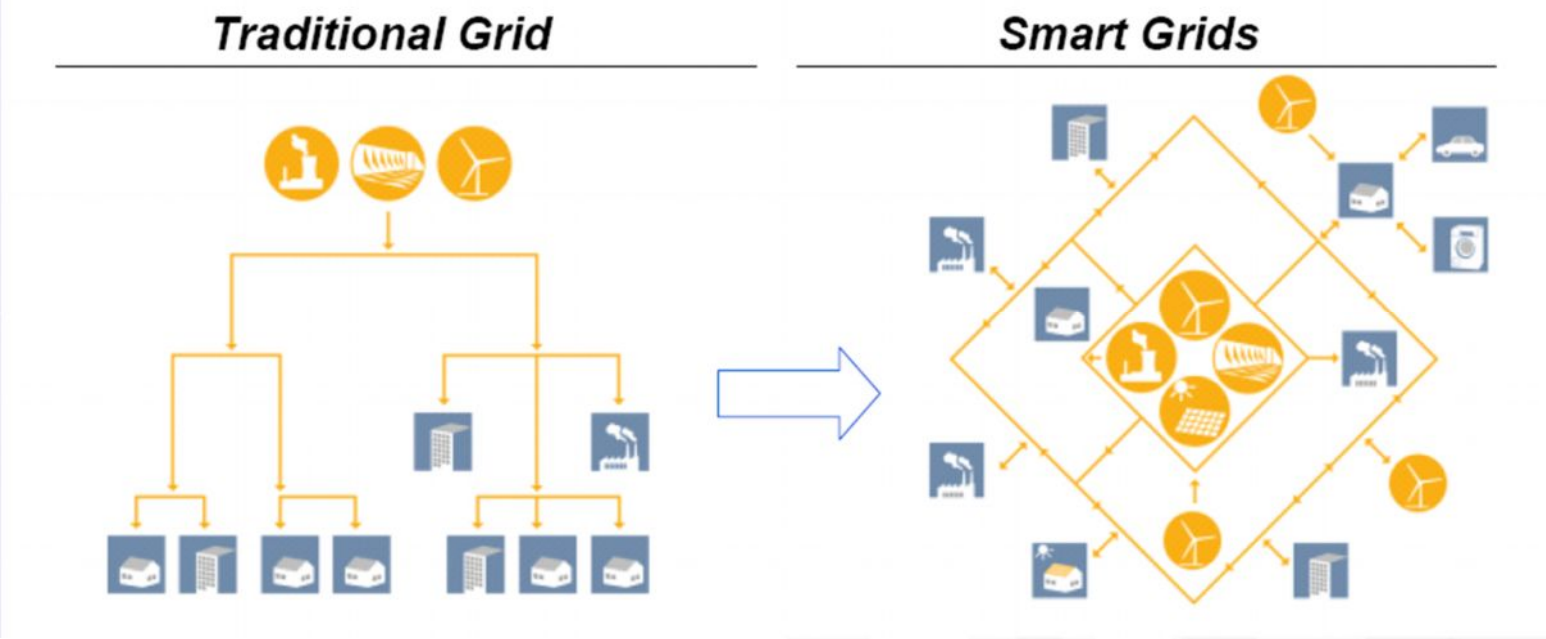
Alina Fedosova

Perm 2012

Structure

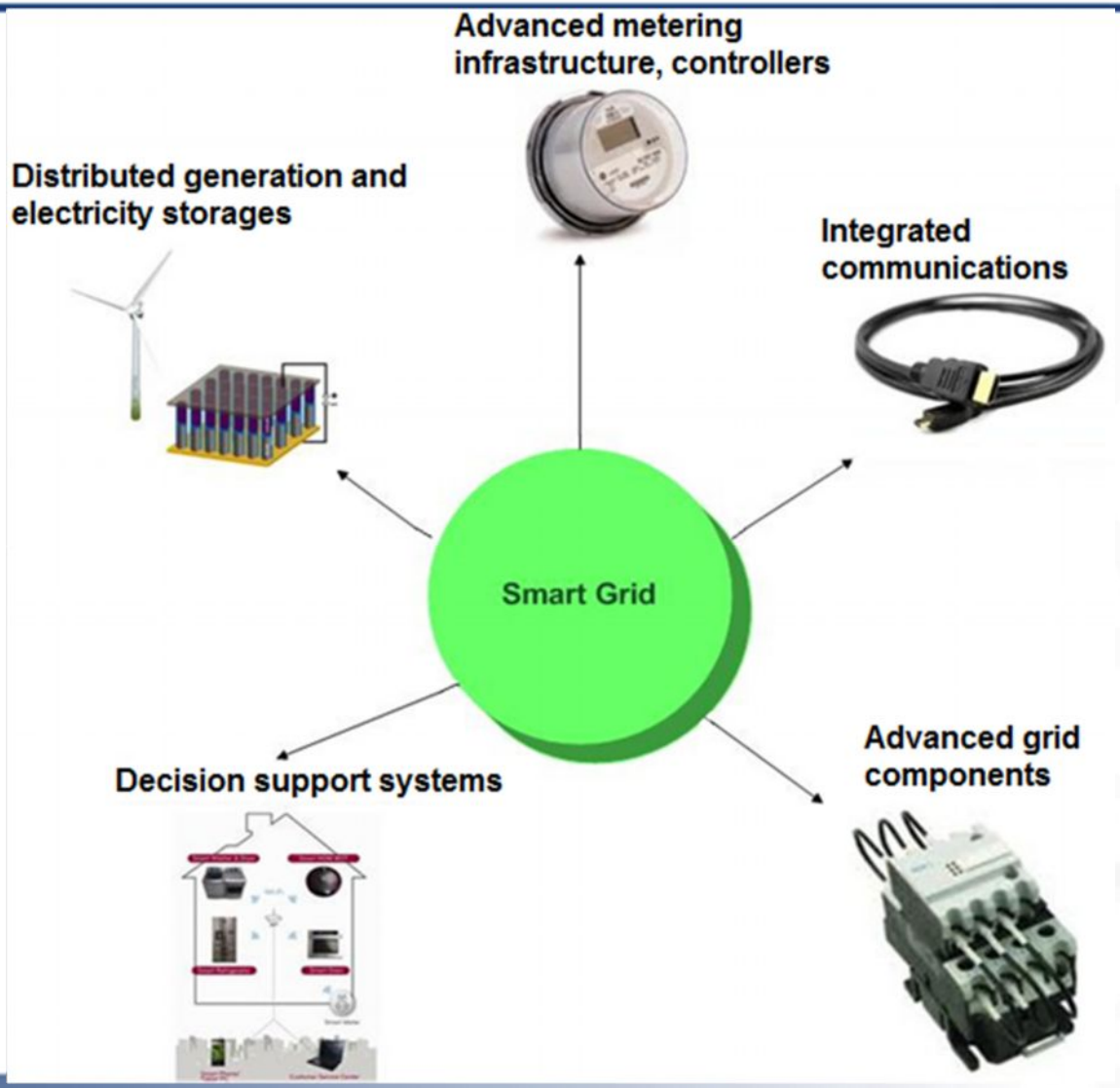
1. What Smart Grid is
2. Tasks behind Smart Grid
3. Approaches to Smart Grid introduction
4. Approaches to Smart Grid efficiency assessment, preliminary results for the Russian UES
5. Offered approach to Smart Grid assessment

1. What Smart Grid is

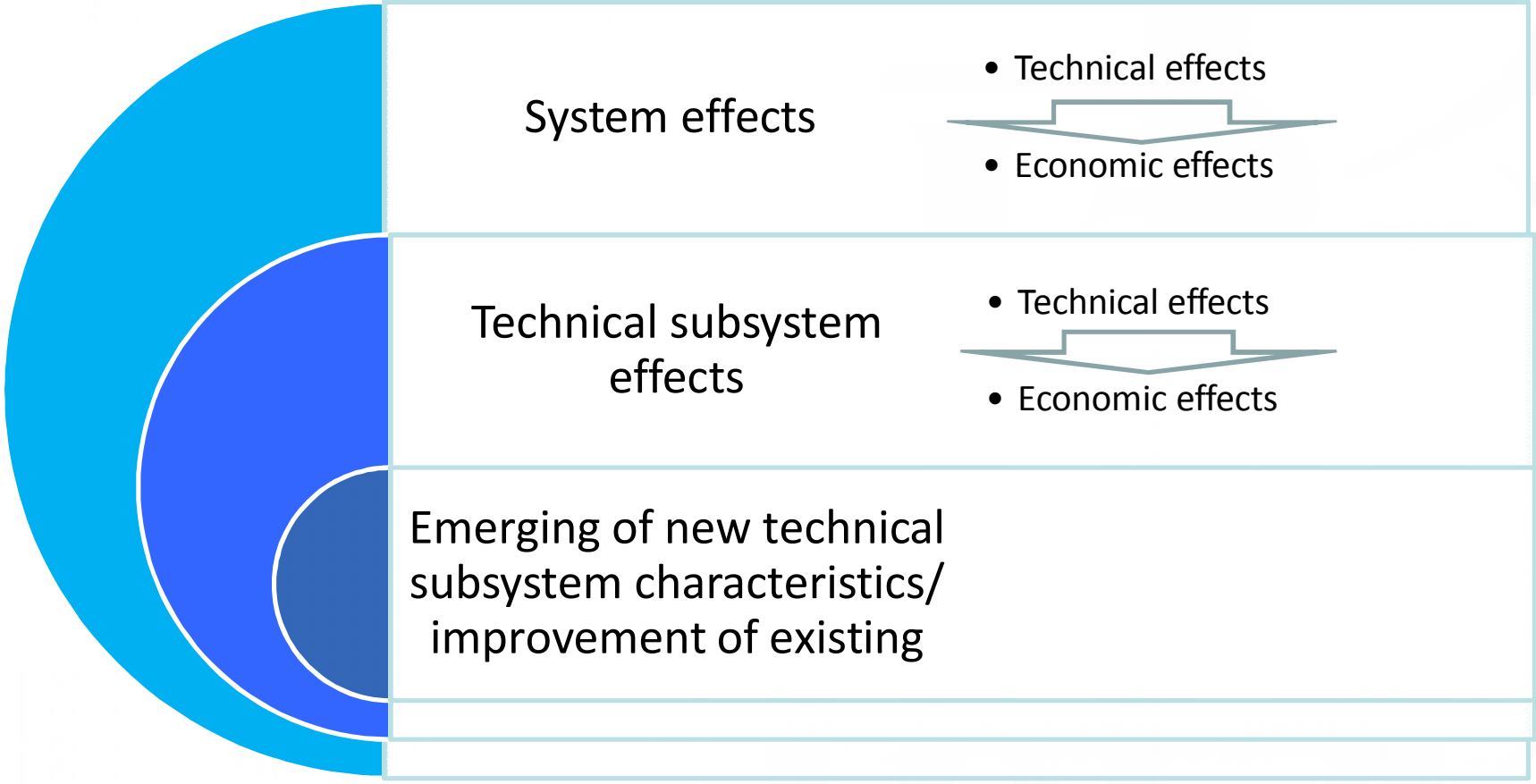


Smart Grid is a concept of electric power industry innovative development, based on fully integrated, self-regulating and self-healing system characterized by network configuration, including all generation, transmission and distribution, all consumer types, which is managed automatically in real-time mode.

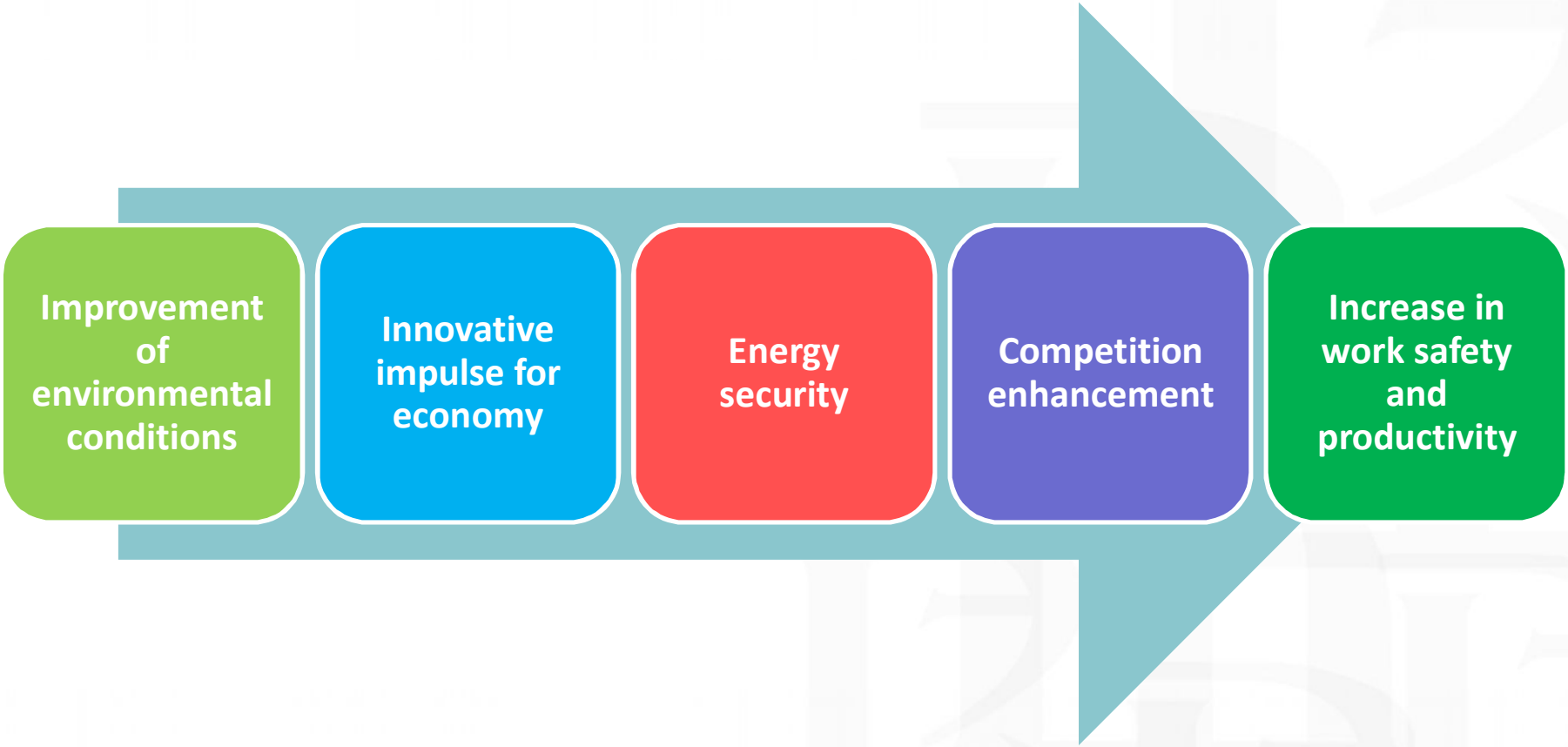
Smart Grid key technology areas



Effects caused by SG implementation



Smart Grid external effects



2. Tasks behind Smart Grid

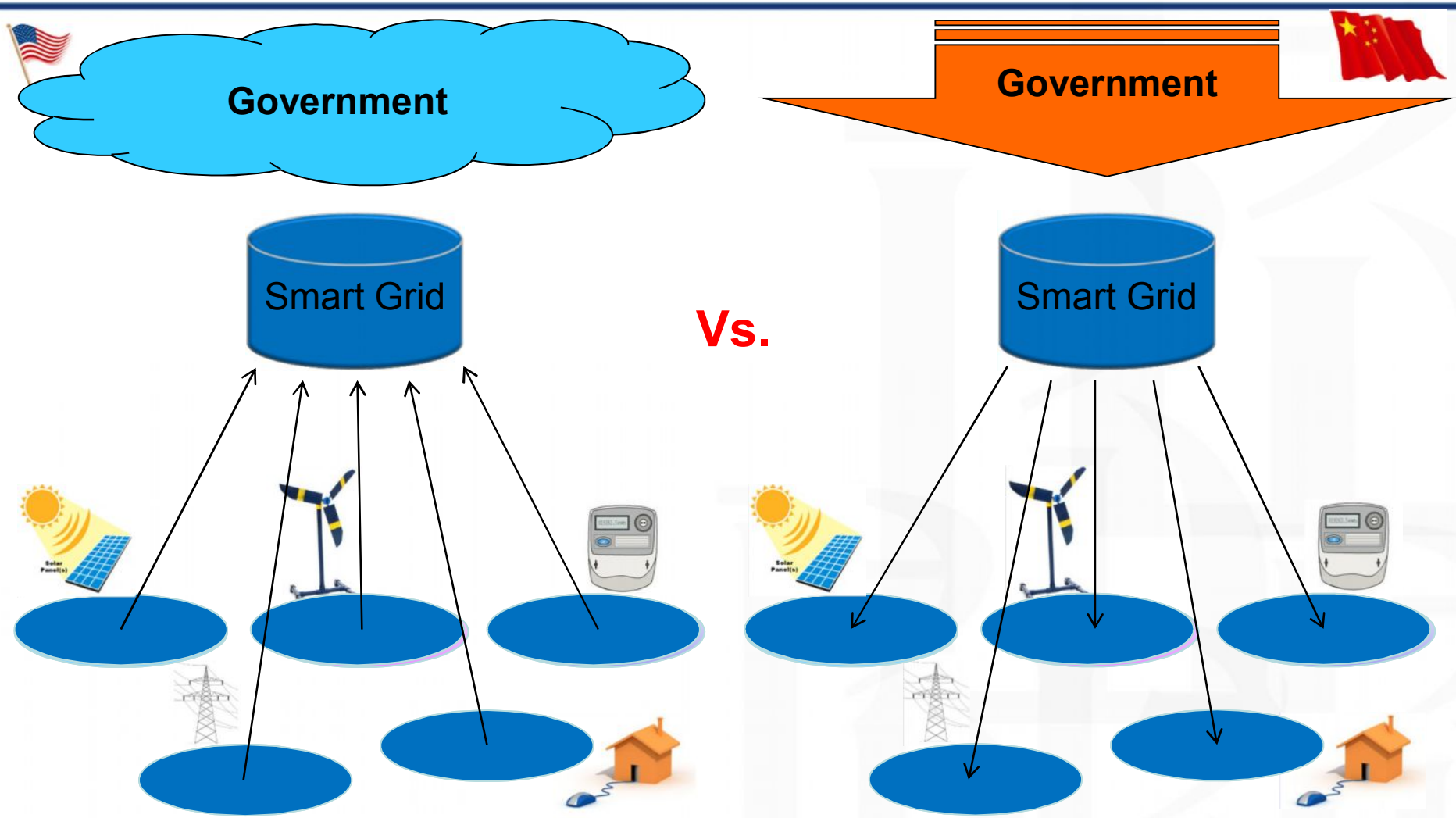
Decrease in economic losses

Renewables and electric vehicles' integration in energy system

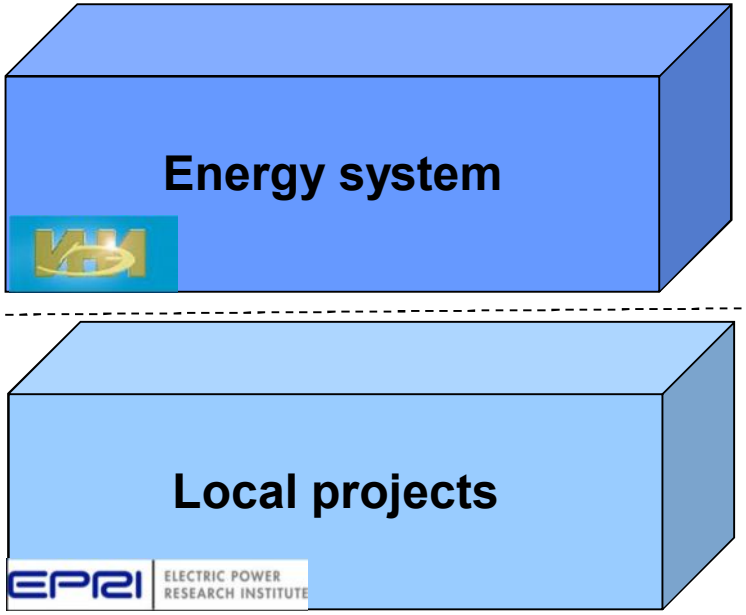
Enhancement of retail market competition

Energy systems and markets integration

3. Approaches to Smart Grid introduction



4. Approaches to Smart Grid economic efficiency assessment, preliminary results for Russian UES



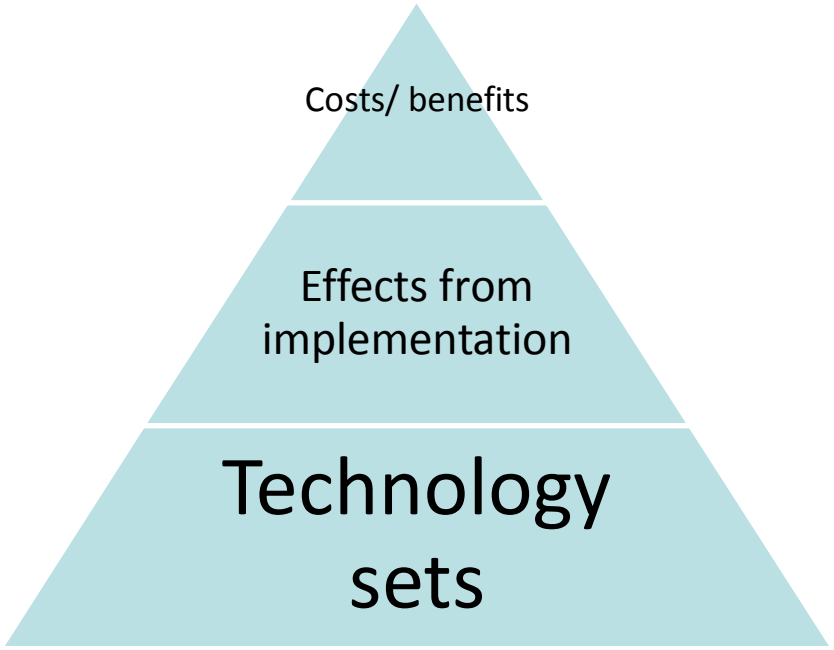
Problems:

- **Wide range of external effects for different stakeholders**

- **Broad scope of technologies**
- **Various scale of projects**
- **Span of markets and market participants**

Two approaches to energy system scale estimations

Traditional approach:

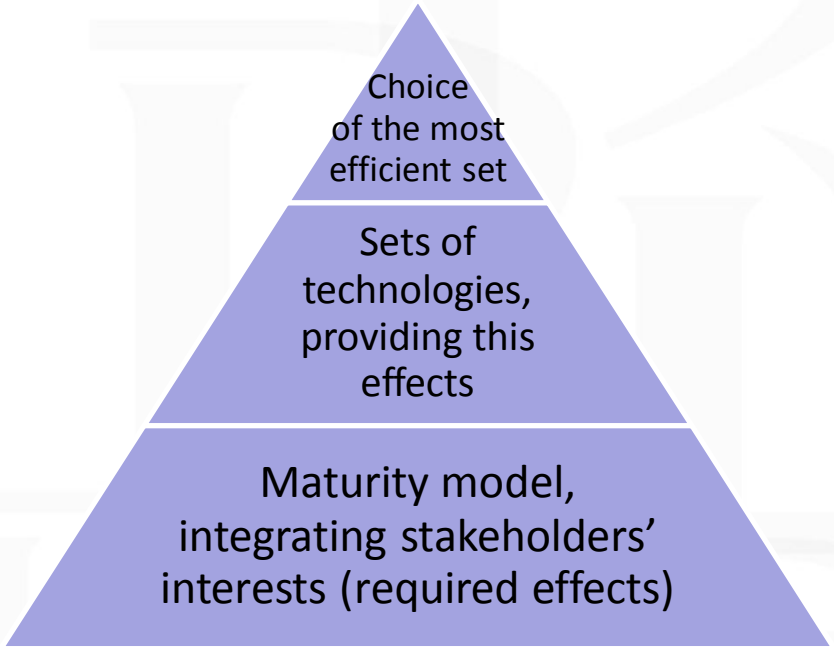


Used by ERI RAS, EPRI

Disadvantages:
- Difficulties in synergy effect assessment
- Stakeholders' interests are ignored
- The range of effects are neglected to simplify assessment
- Better suits local projects

vs.

Maturity model – based approach

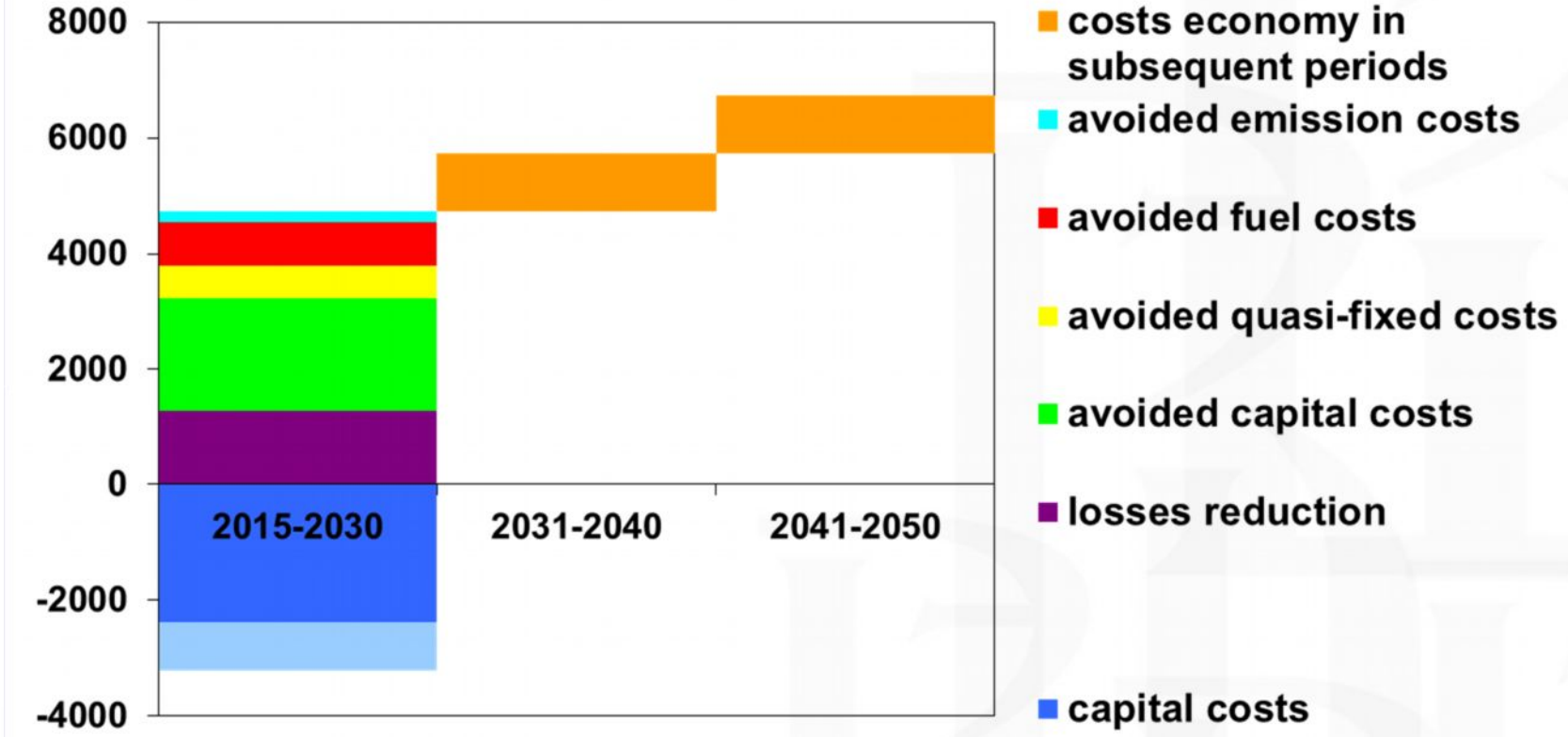


Used in "West Virginia Smart Grid Implementation Plan"

Disadvantages:
- Significant allowances

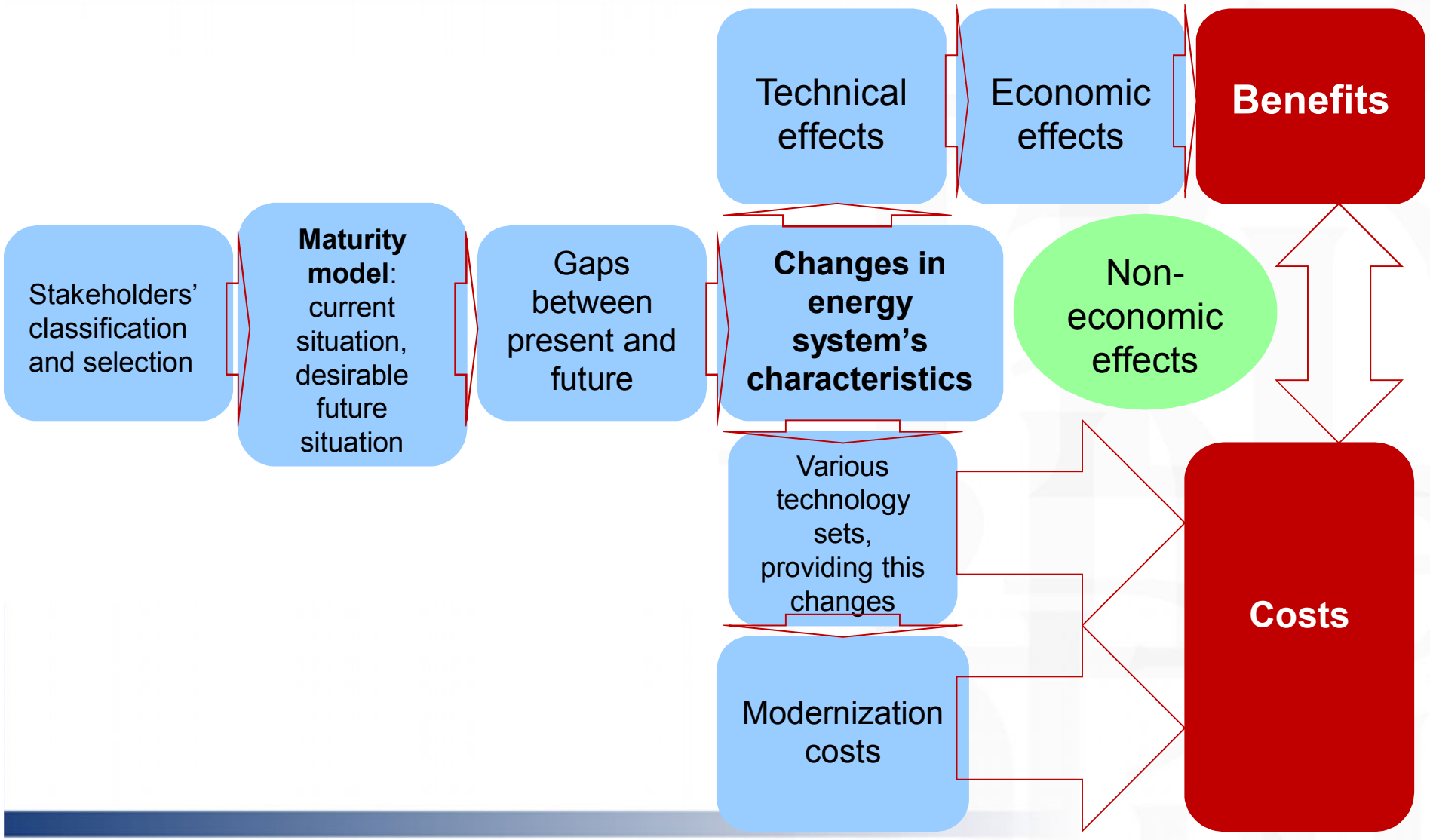
ERI RAS estimations, preliminary results for the Russian UES

billion RUR 2010



Benefit to cost ratio is 3:1

5. Offered approach to Smart Grid assessment



Thank you for attention!