TITLE

AUTHOR

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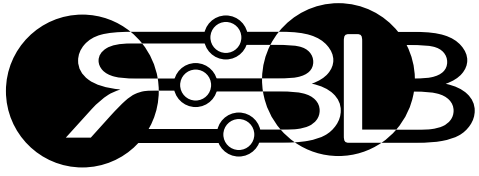
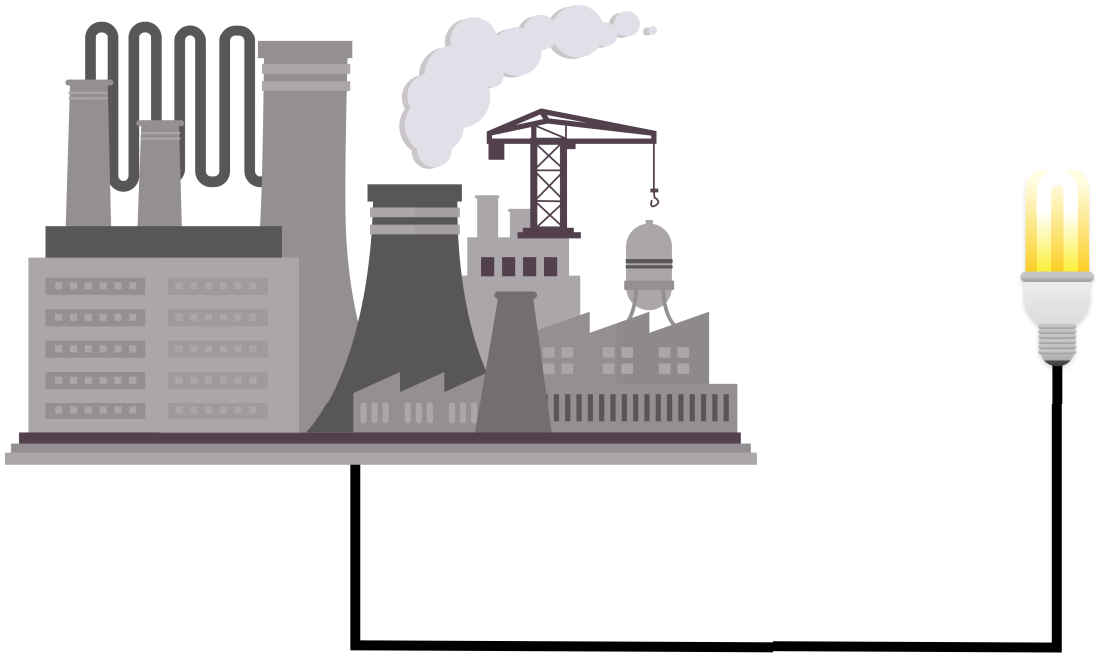


Contents

Problem Statement

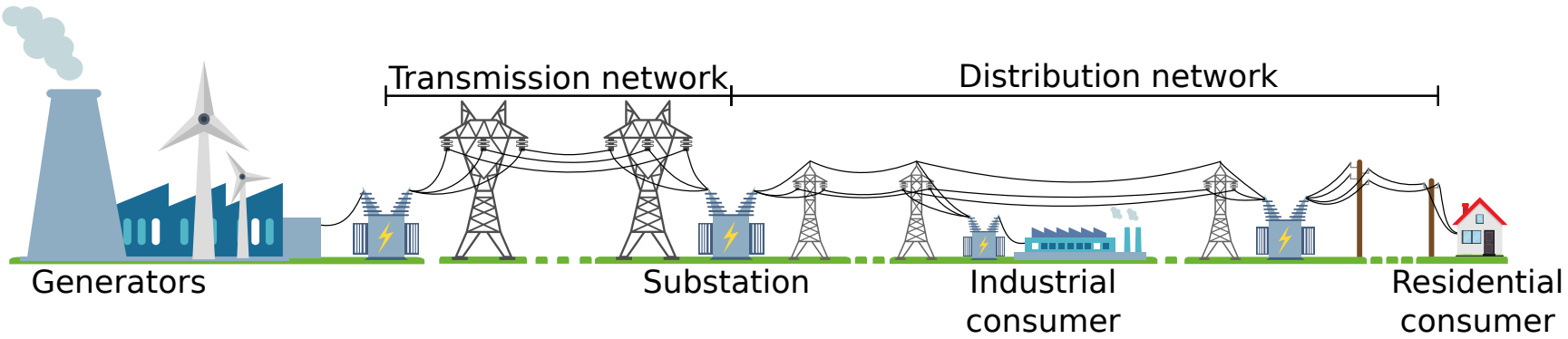
Golden Rule

$$\text{Generation} = \text{Consumption}, \forall t$$



Origin of major problems...

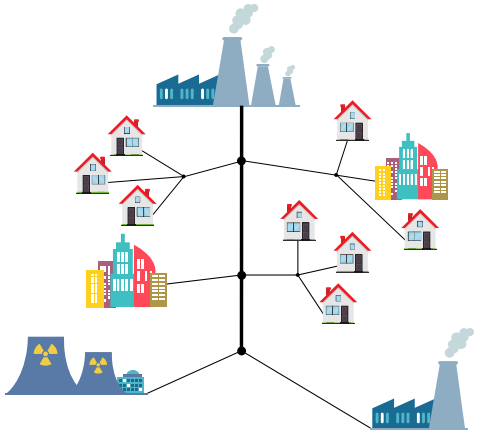
Electric system



- **Generators**: produce electric power from primary sources.
- **Transmission network**: from power plants to substations.
- **Substations**: power conditioning and safety mechanism.
- **Distribution network**: from substations to consumers.
- **Consumption**: transforms electric power into work.

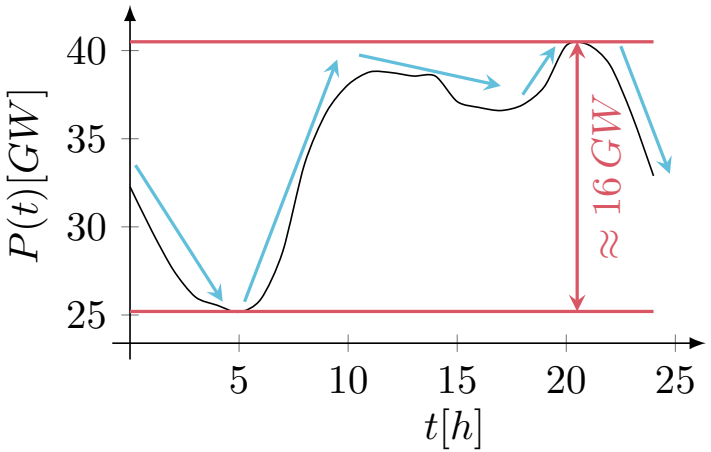
Problems

Generation must adapt to consumption, but ...



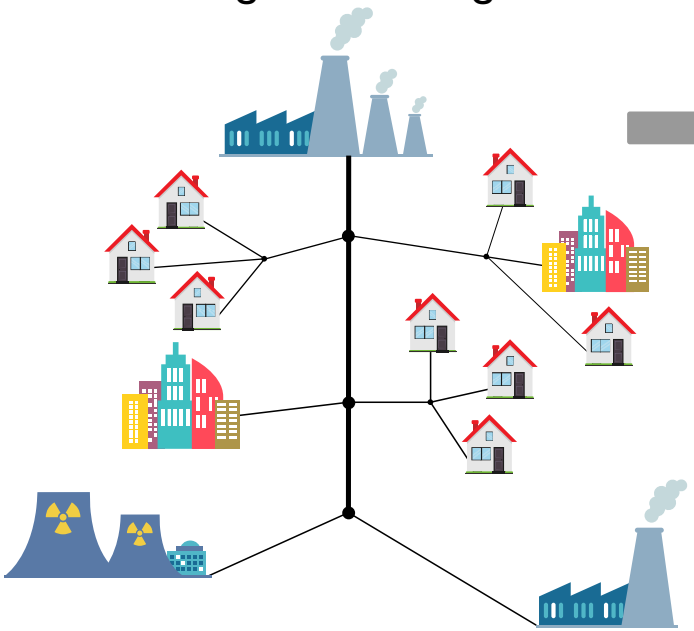
- **Grid:**
  - Centralized system
  - Ageing infrastructure
  - Generation far from consumption
  - Losses $\longrightarrow$ Efficiency $\downarrow\downarrow$

- **Consumption:**
  - High variability
  - High responsiveness
  - System stress
  - Grid oversizing

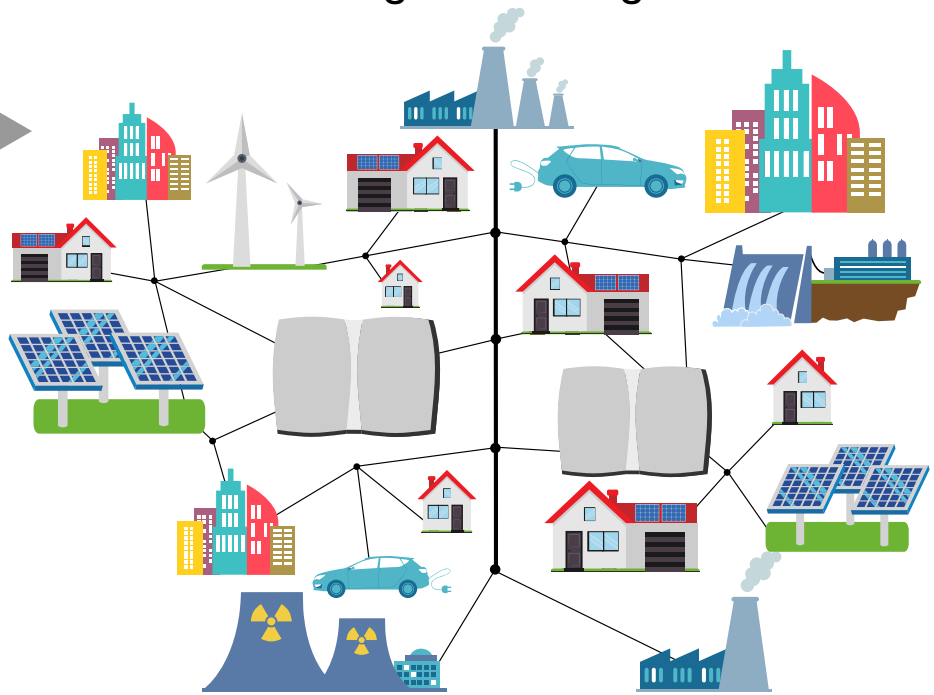


Solution(I): Evolution of the grid

Old generation grid



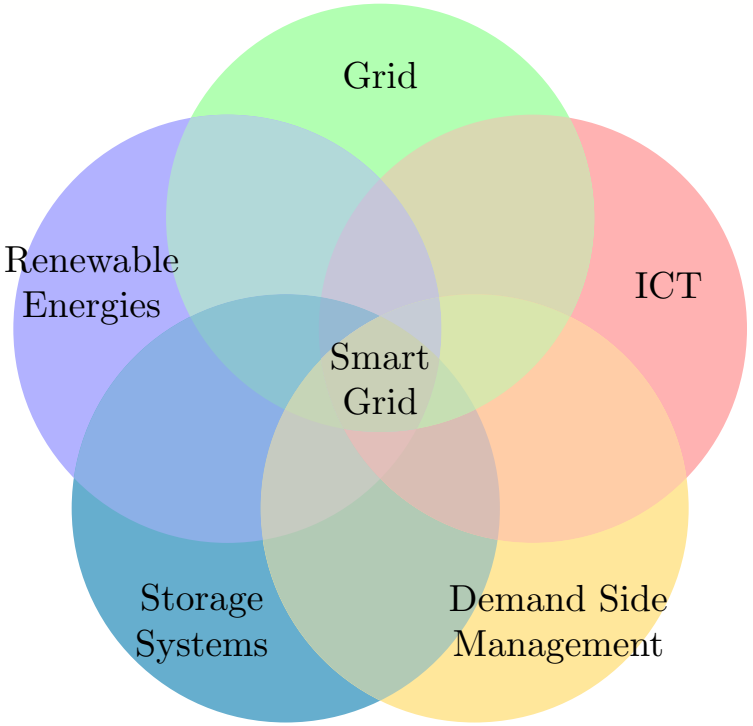
New generation grid



- Centralized
- ↓ Efficiency
- ↓ Communication

- Distributed
- ↑ Integration
- ↑ Participation

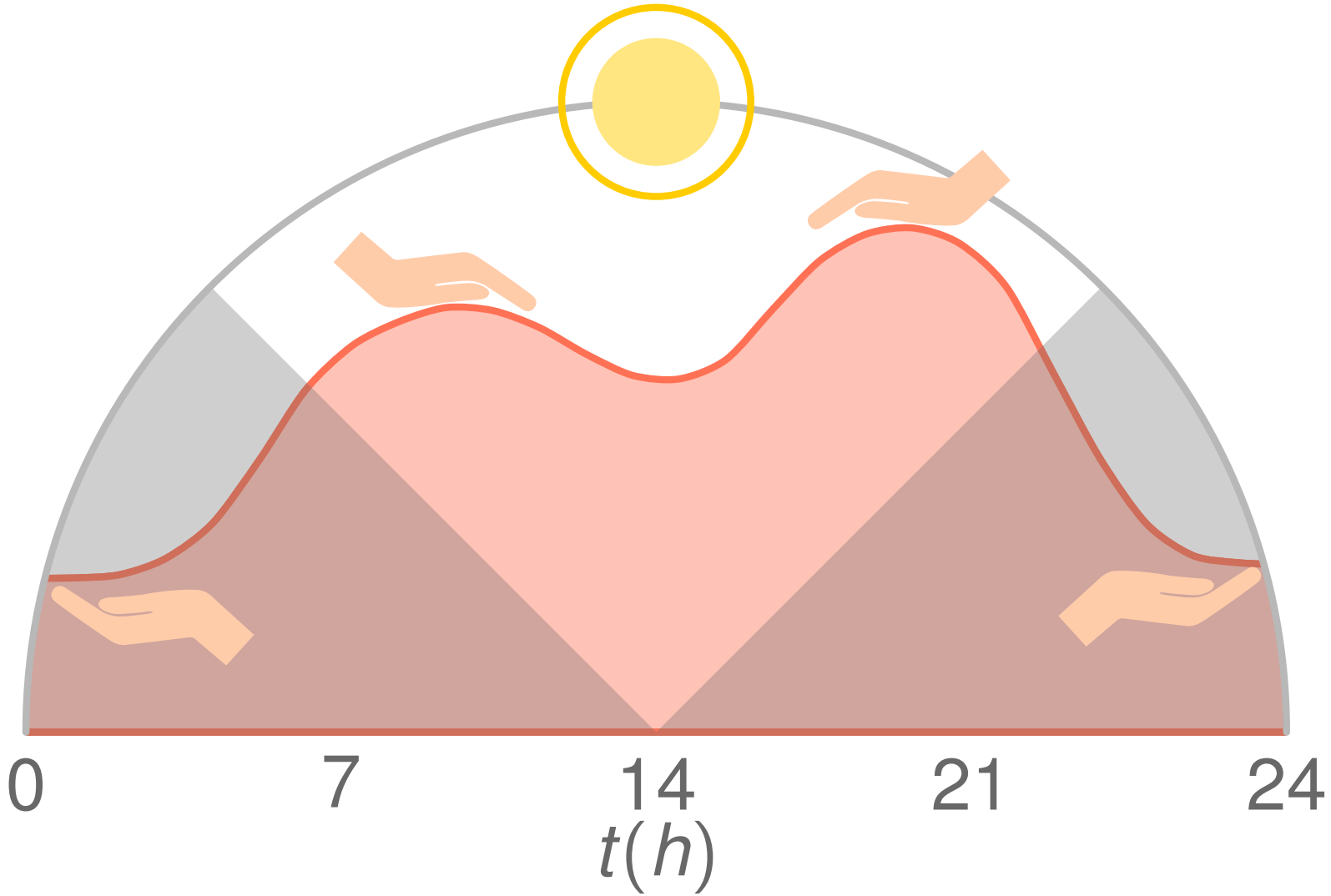
Solution(II): Smart Grid



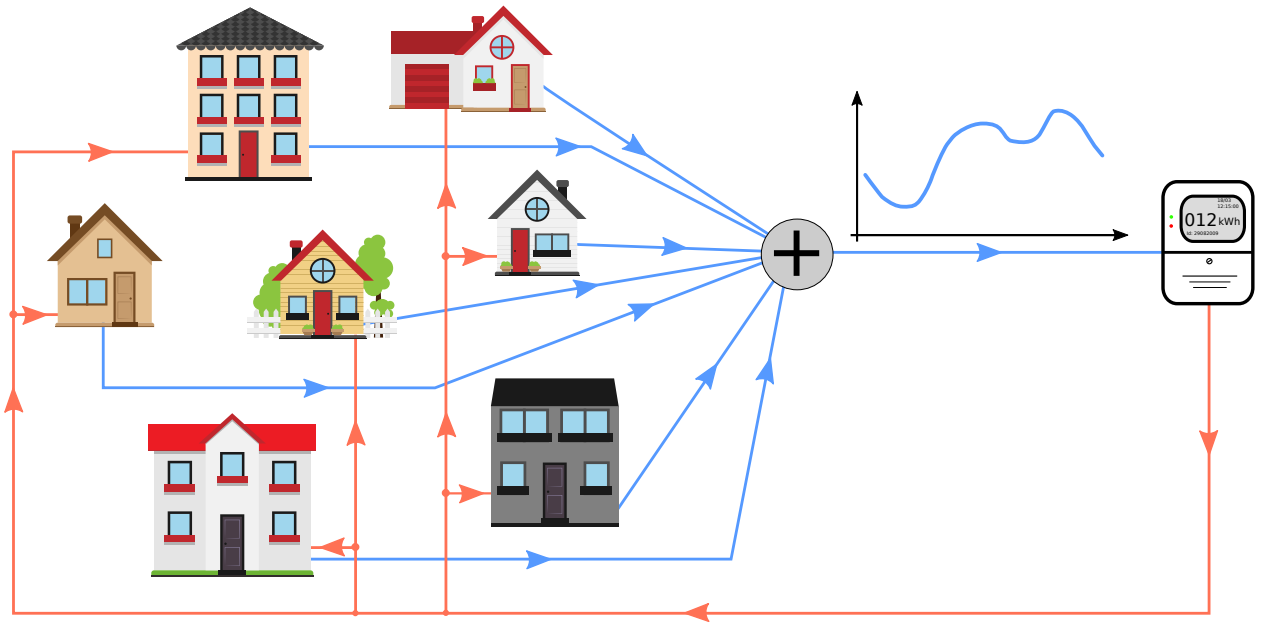
Definition

An electricity network that uses communication technologies to coordinate the needs and capabilities of all grid members to operate efficiently, minimising costs and environmental impacts while maximising reliability, resilience and stability.

Variability reduction: DSM



Thesis Aim



Objective

Development of an adaptive algorithm to manage the consumption of a collective of individuals with the presence of distributed energy resources (PV + local storage).
The algorithm enhances the efficiency of a grid by reducing the variability of the aggregated consumption.

Contents

Conclusions

Questions


Thank
You
Vinaka
köszönöm
Kiitos
Maake
Asante
Shukria
Dhanyavadagalu
감사합니다
Kam Sah Hammida
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Biyan
Terima Kasih
Taiku
Blagodaram
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Grazas
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谢
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Matur
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Danke
Merci
Go Raibh Maith Agat
Eskerrik Asko
谢
Salamat
ขอขอบคุณคุณ
Najis Tuke