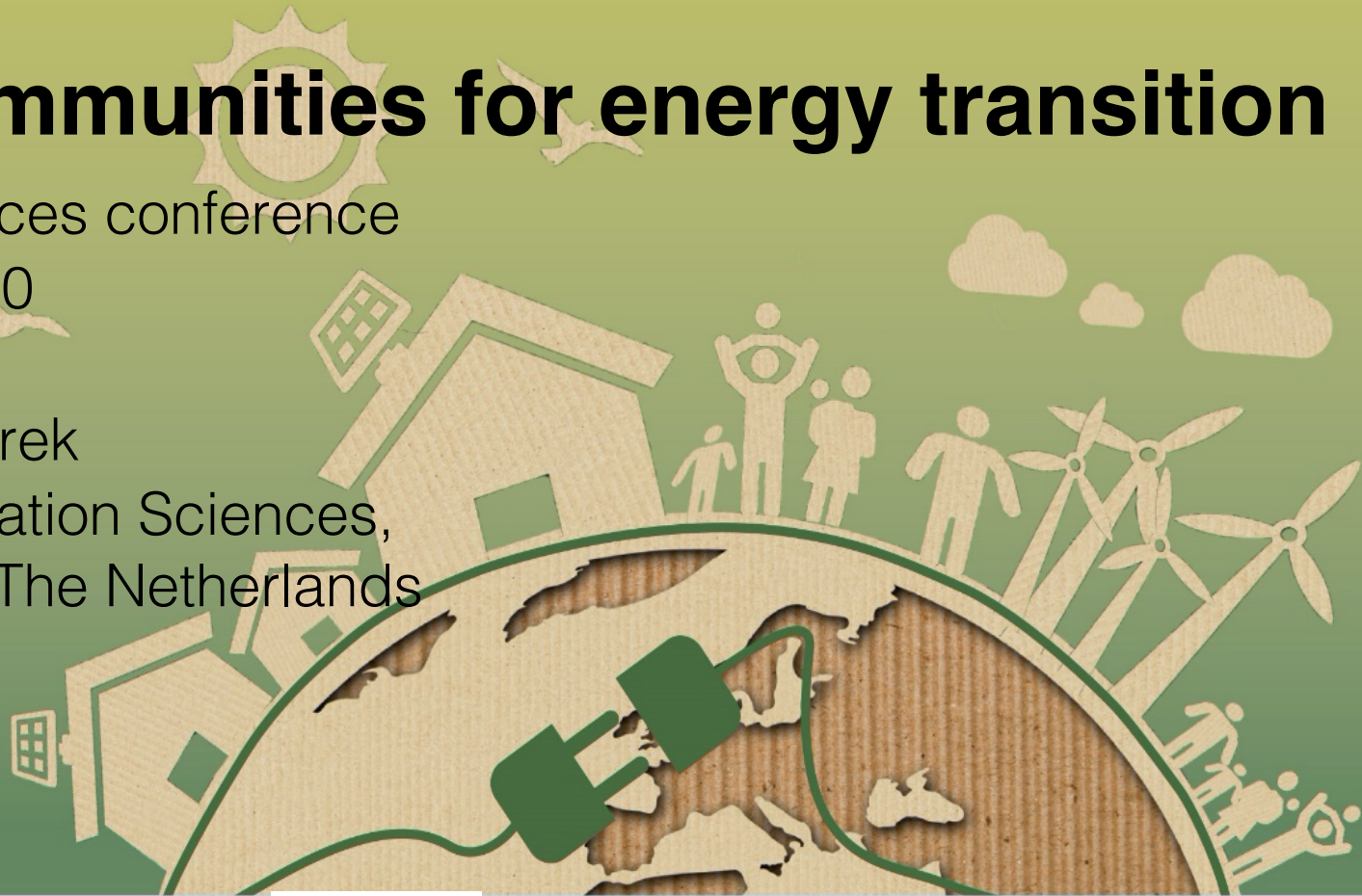


# Energy communities for energy transition

Sustainable Places conference  
30 October 2020

Anna J. Wieczorek  
School of Innovation Sciences,  
TU Eindhoven, The Netherlands



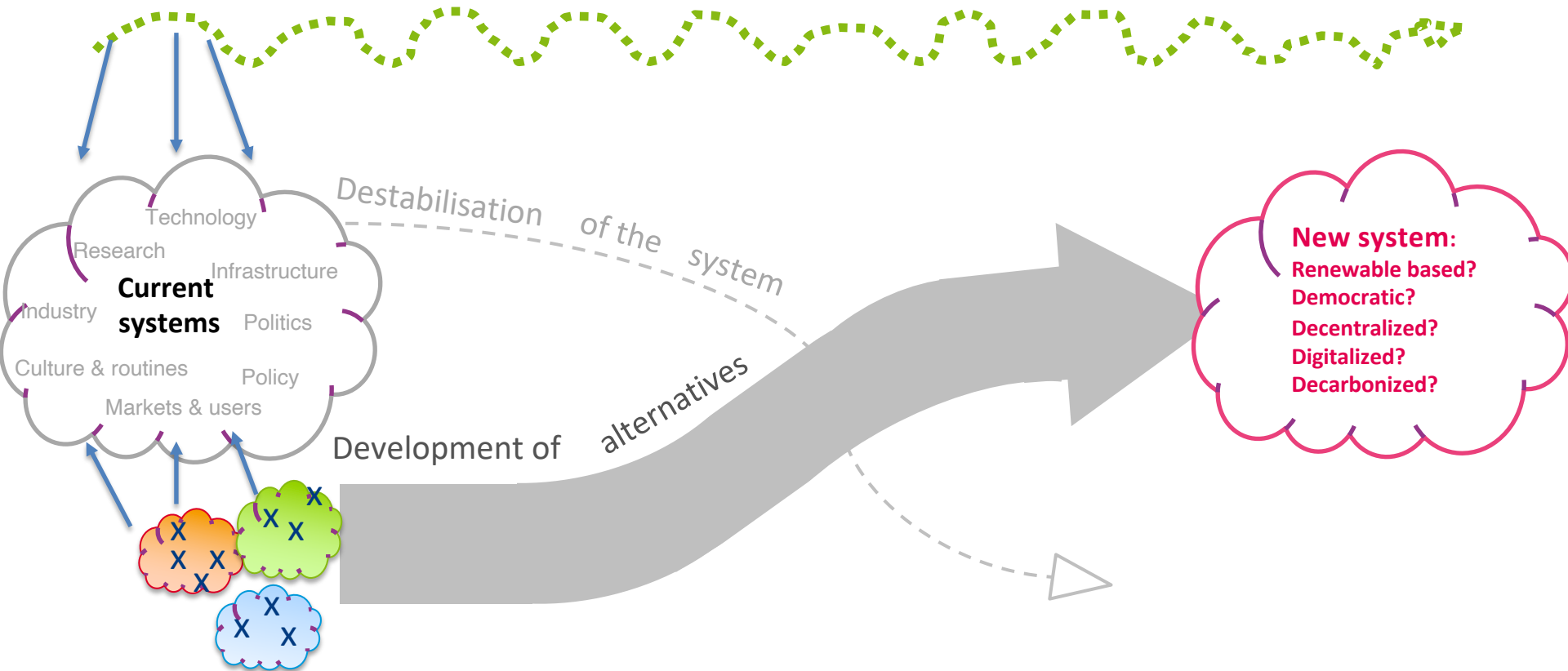
# Outline

1. Energy system in transition
2. cVPP as an accelerator
3. Possible roles for communities

# Current energy system is in transition

Radical change is an outcome of many factors

## Broad context



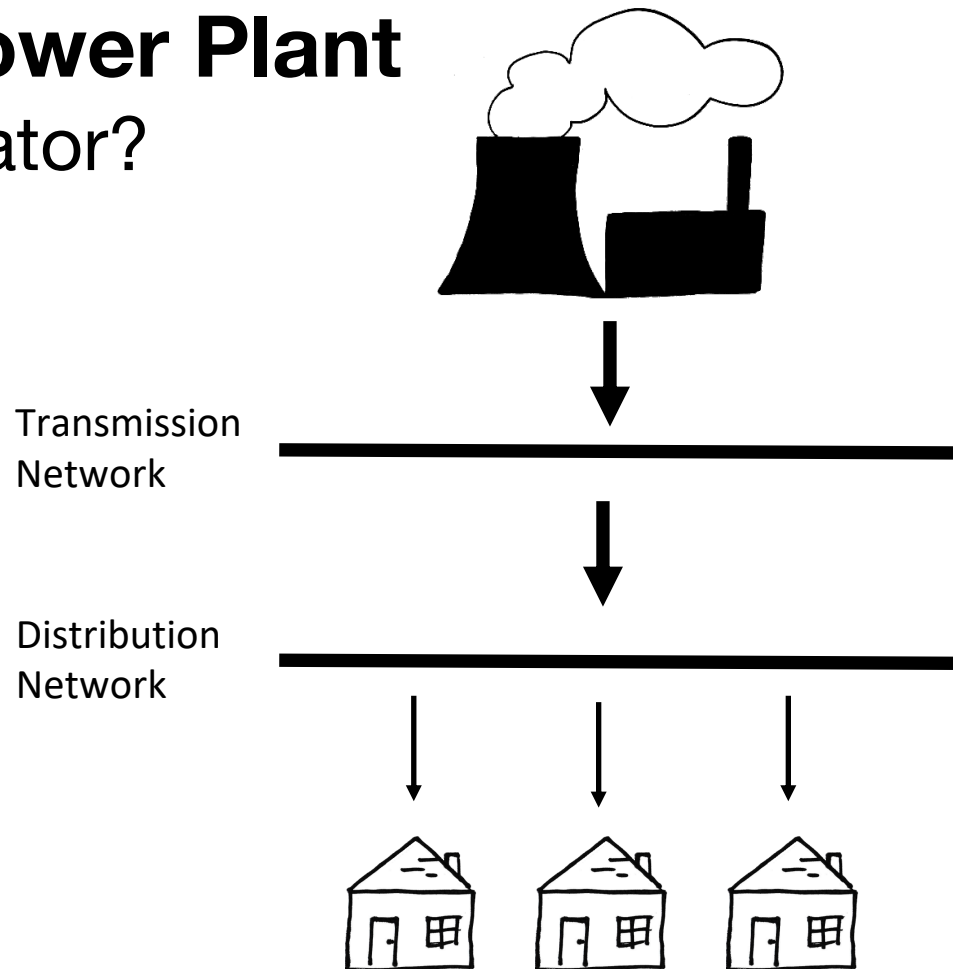
Energy transition  
is about a **different way of organising**  
our energy system

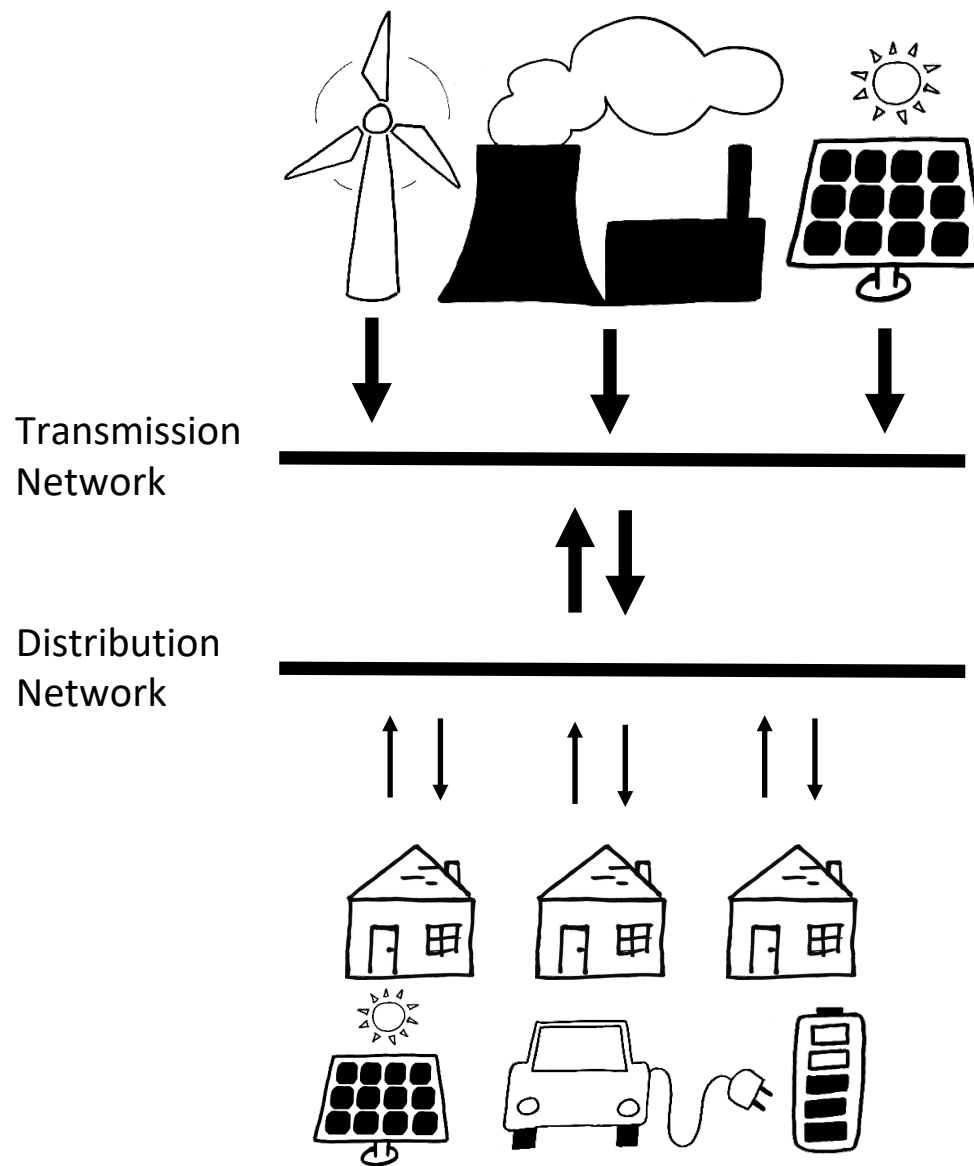
# But the progress is slow

- Technological innovations
- Focus on production side & efficiency
- Market dominance of established large companies
- Community energy initiatives missing critical mass
- No incentives to be active players in the market

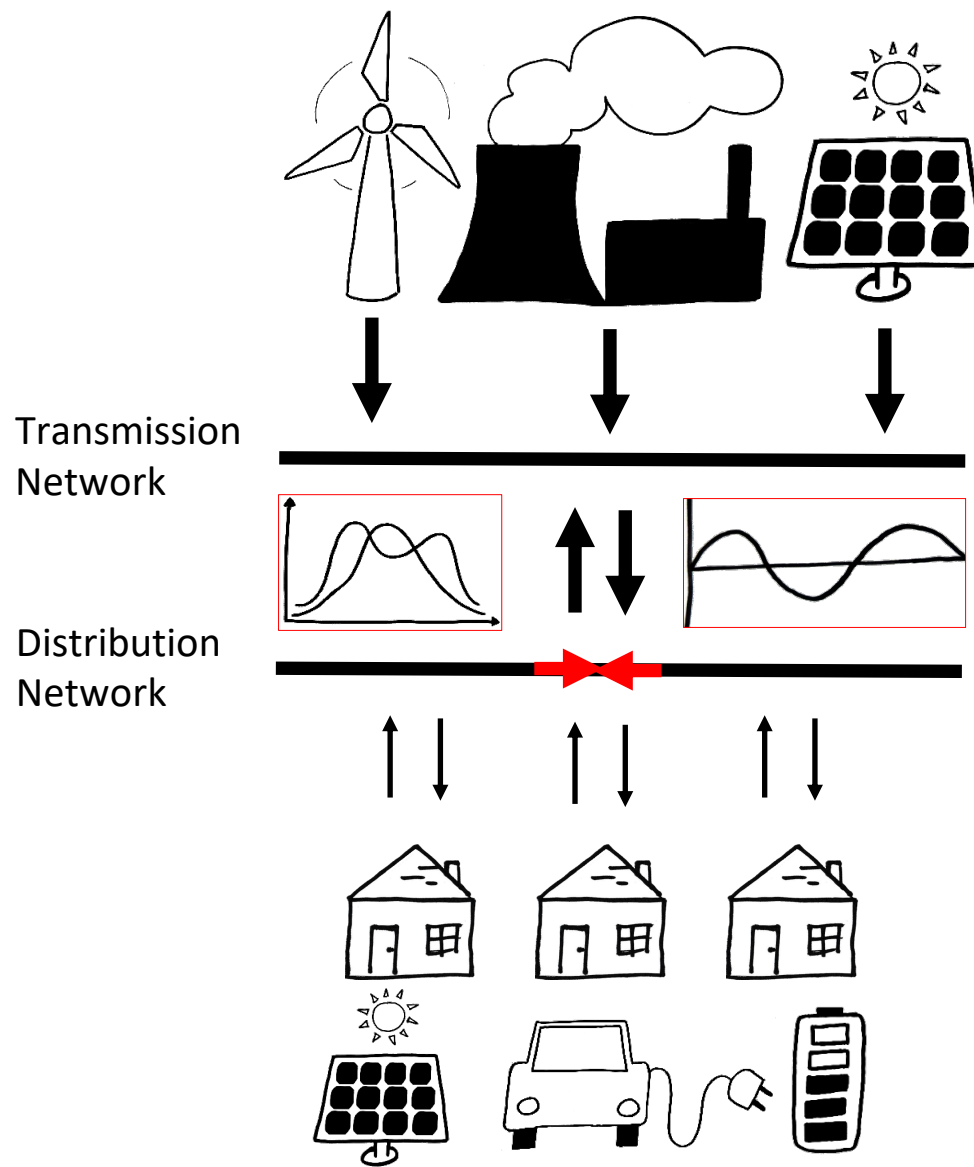
# Virtual Power Plant

## An accelerator?



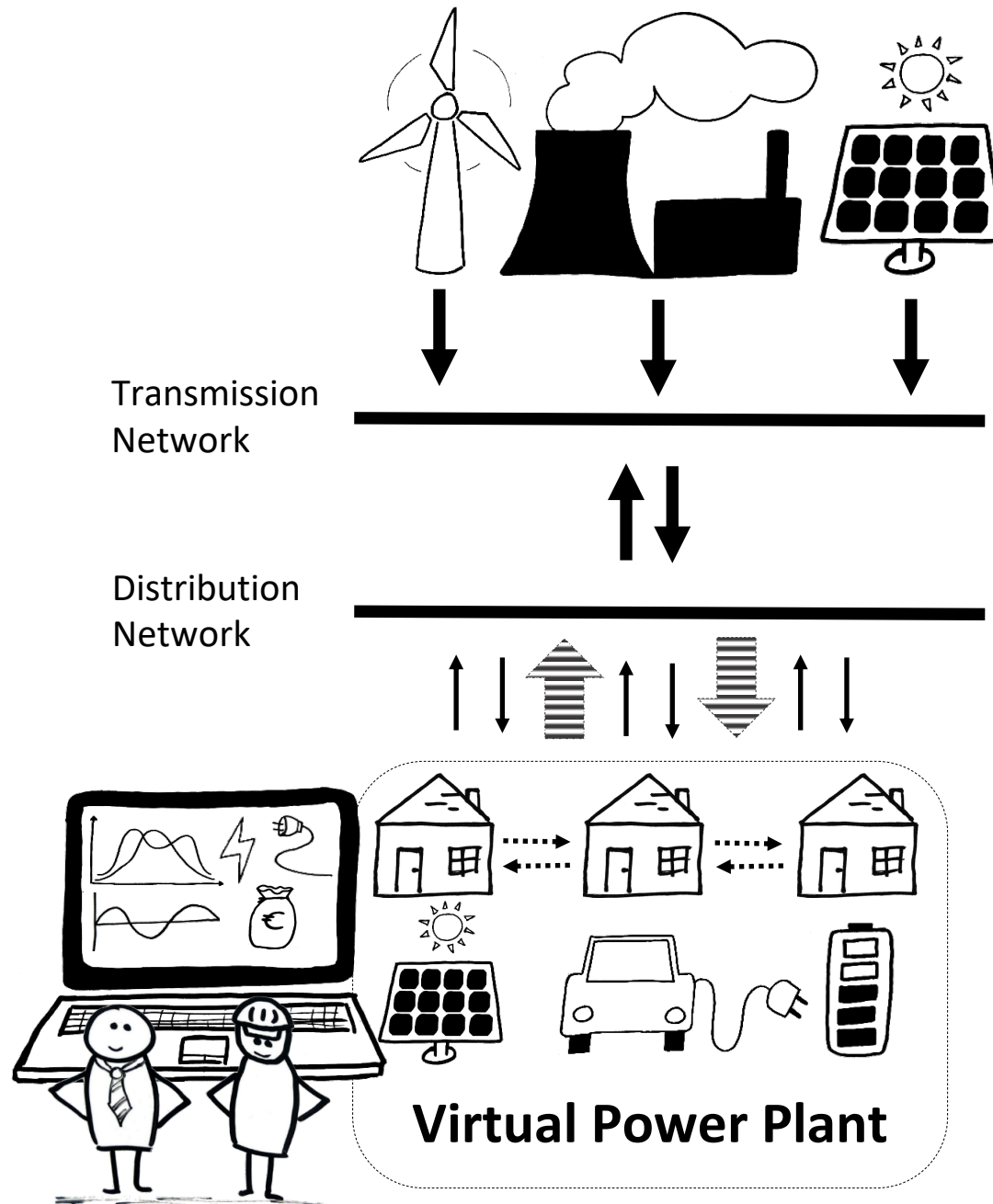


Picture by Luc van Summeren



Picture by Luc van Summeren





Picture by Luc van Summeren

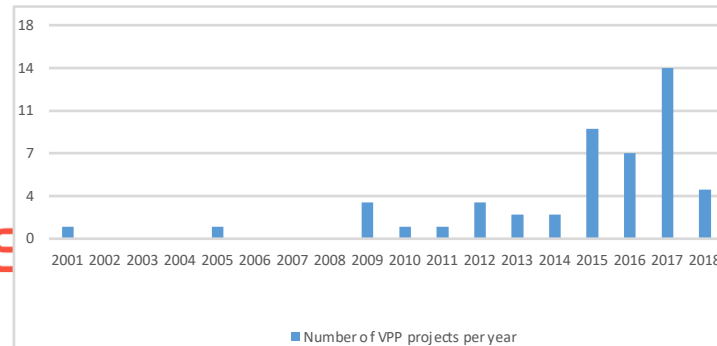
# Virtual Power Plant

- **Software-based** solution (control architecture)
- Aggregates **distributed energy resources** (DG, DR, storage)
- Acts as coordinated **single entity** similar to a conventional power plant
- Allows to perform new **roles in the electricity system** (managing, trading)

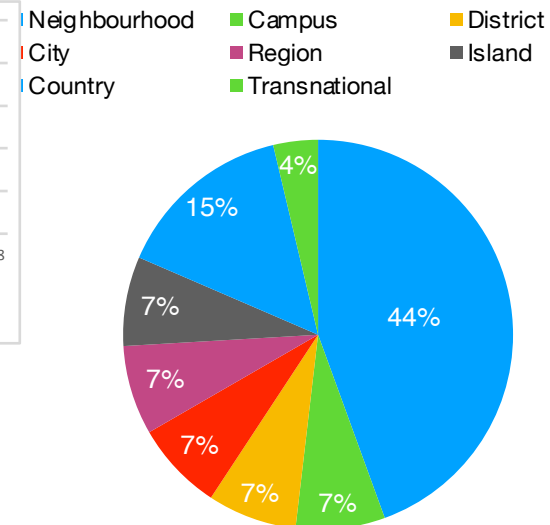
van Summeren, Wieczorek and Verbong, 2019

# VPP: Nothing new

Many on the market



WordItOut

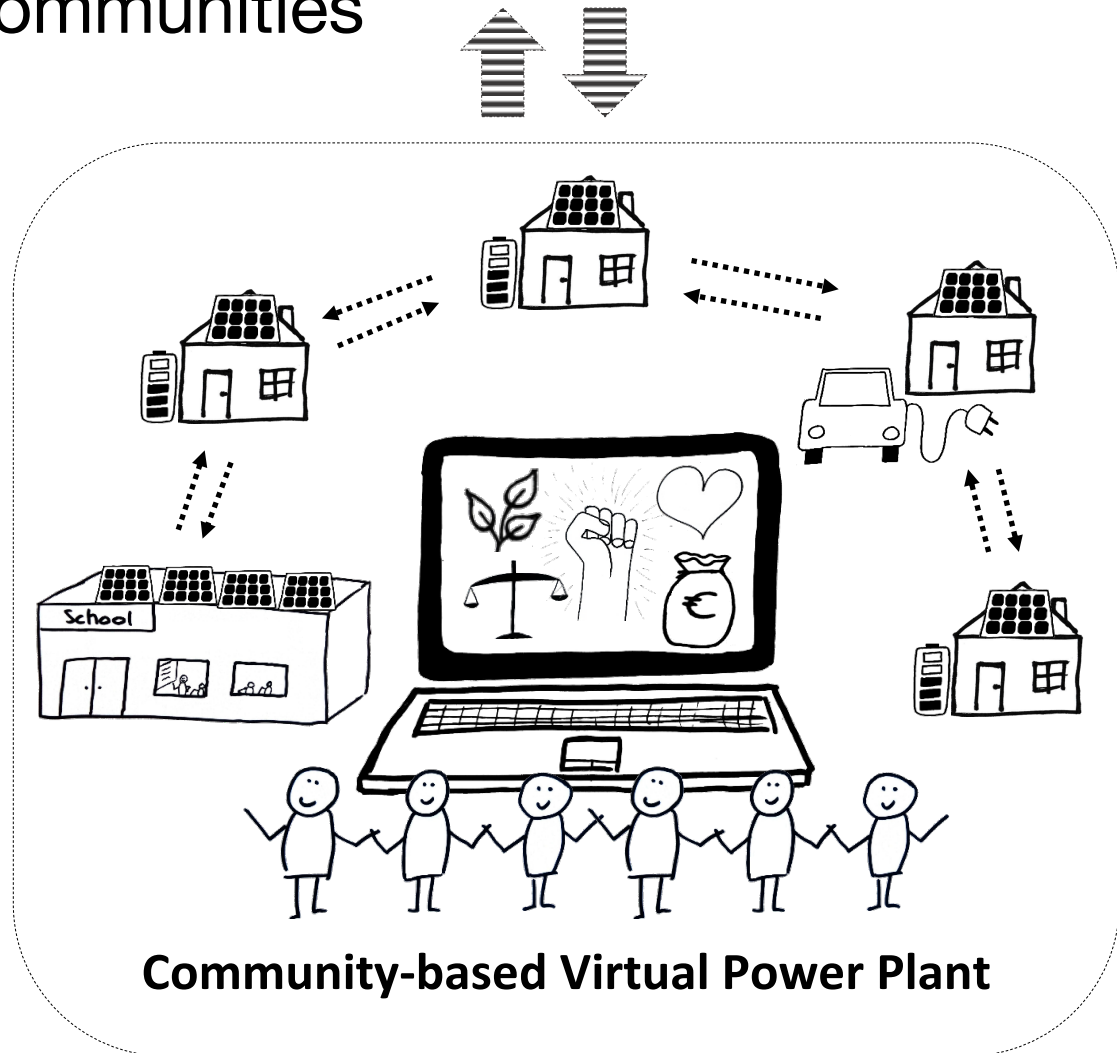


- Initiated top-down: TSO/DSO, research centres
- Aim - technical: grid stabilisation, congestion mgnt, wholesale trading
- Asset ownership - mixed
- Prosumers (selectively) recompensed but with no decisive power
- Community needs - assumed economic, individual focus

# Community version

## Empowering communities

- Stimulating RES
- CO<sub>2</sub> neutrality
- Empower local energy community
- Self consumption
- Local economy
- Minimise cost for society
- Independence



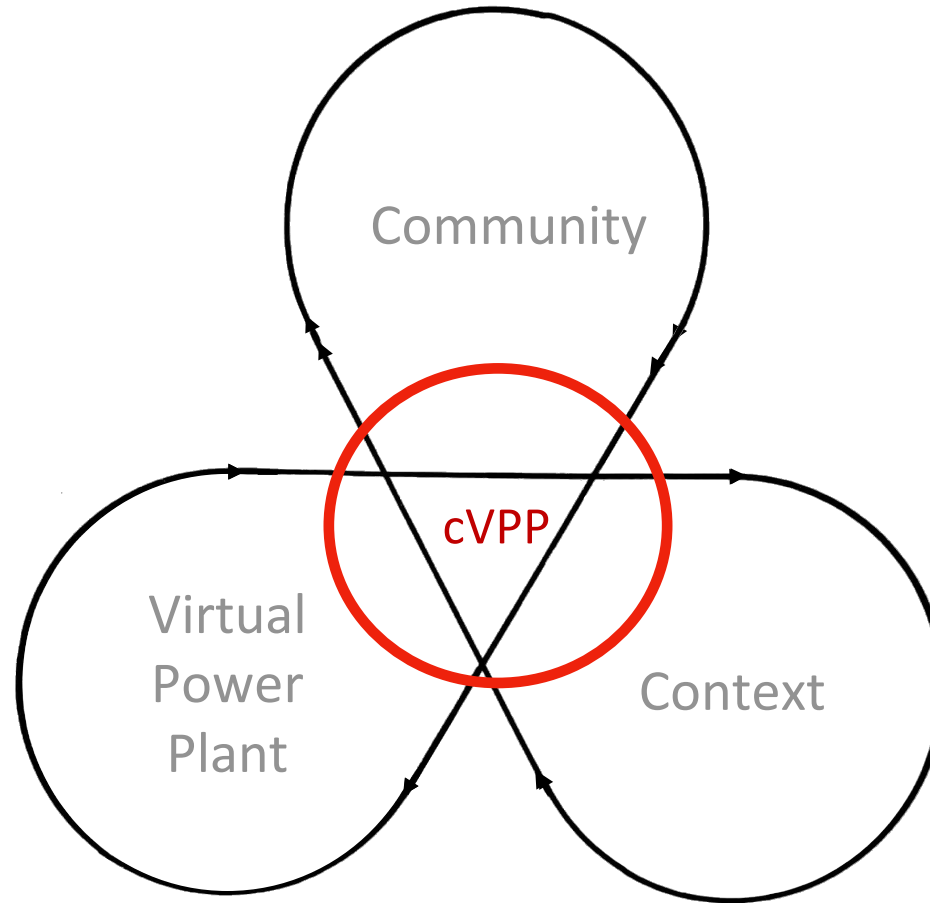
# From VPP to cVPP

Interreg NWE project



# But what exactly is a cVPP?

Socio-technical innovation



# What makes VPP community-based?

## Community logic

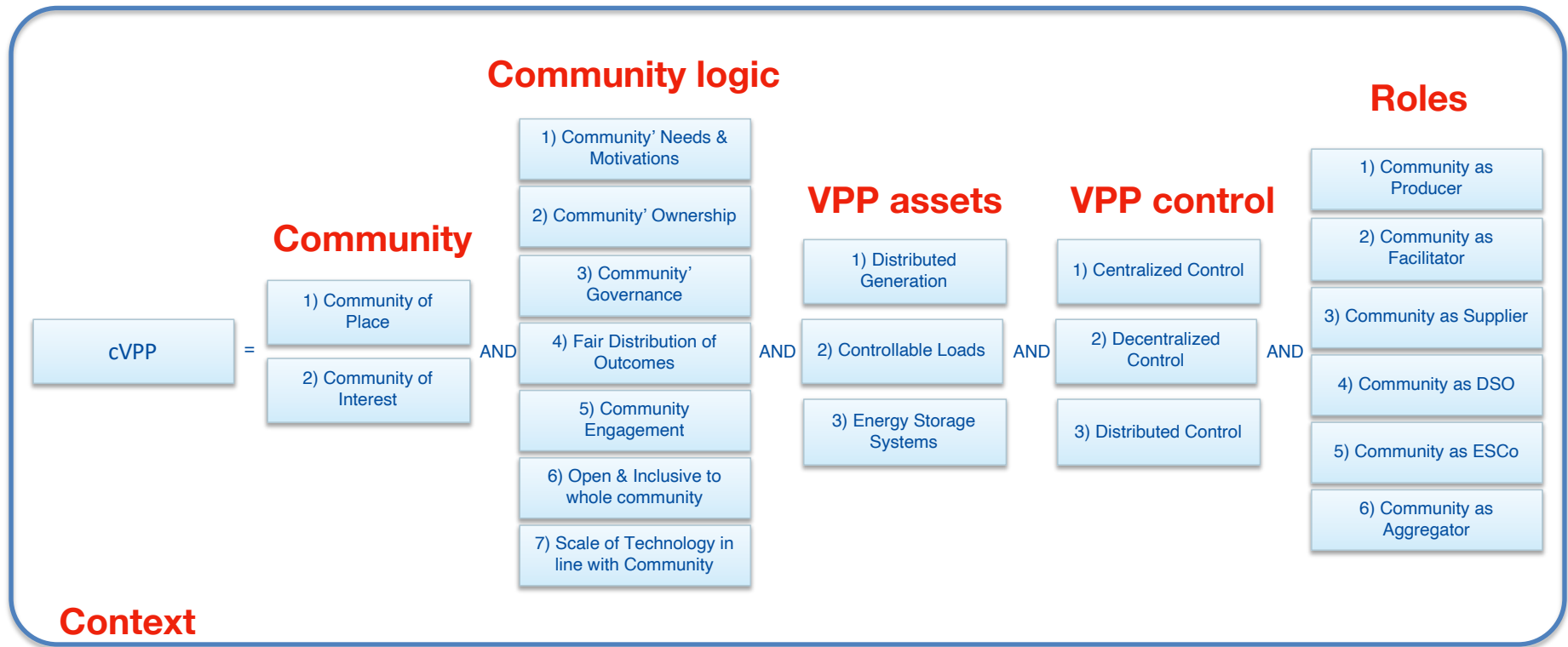
1. Community needs & motivations
2. Distribution of risks and benefits
3. Ownership
4. Governance
5. Engagement
6. Inclusiveness
7. Scale & nature of generation technology

van Summeren, Wieczorek and Verbong, 2020



# Defining cVPP

## Family resemblance principle

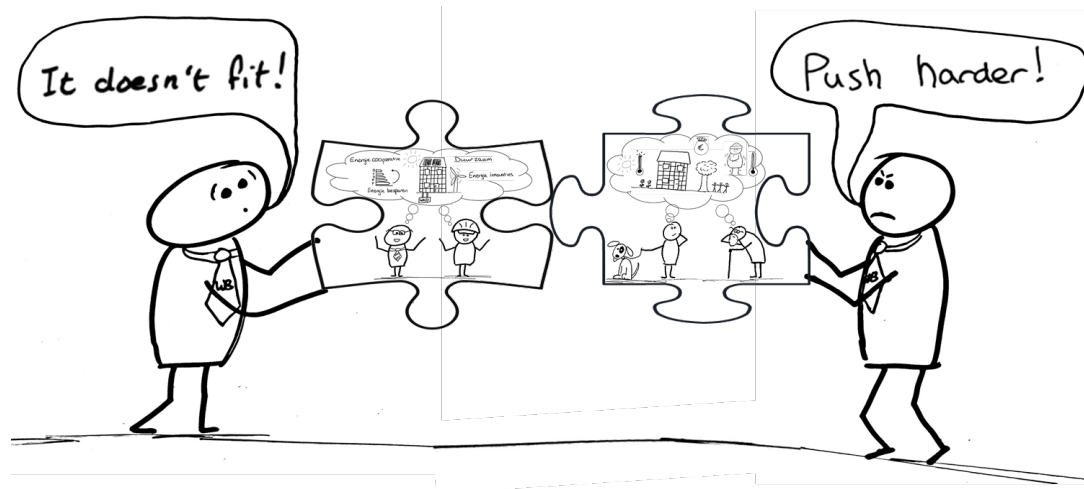
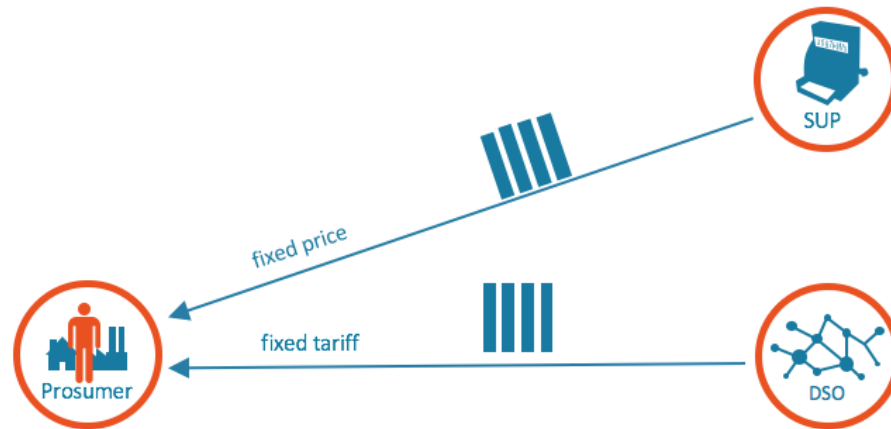


van Summeren, Wieczorek, Verbong, Bombaerts, 2019



# Roles in the **current** energy system

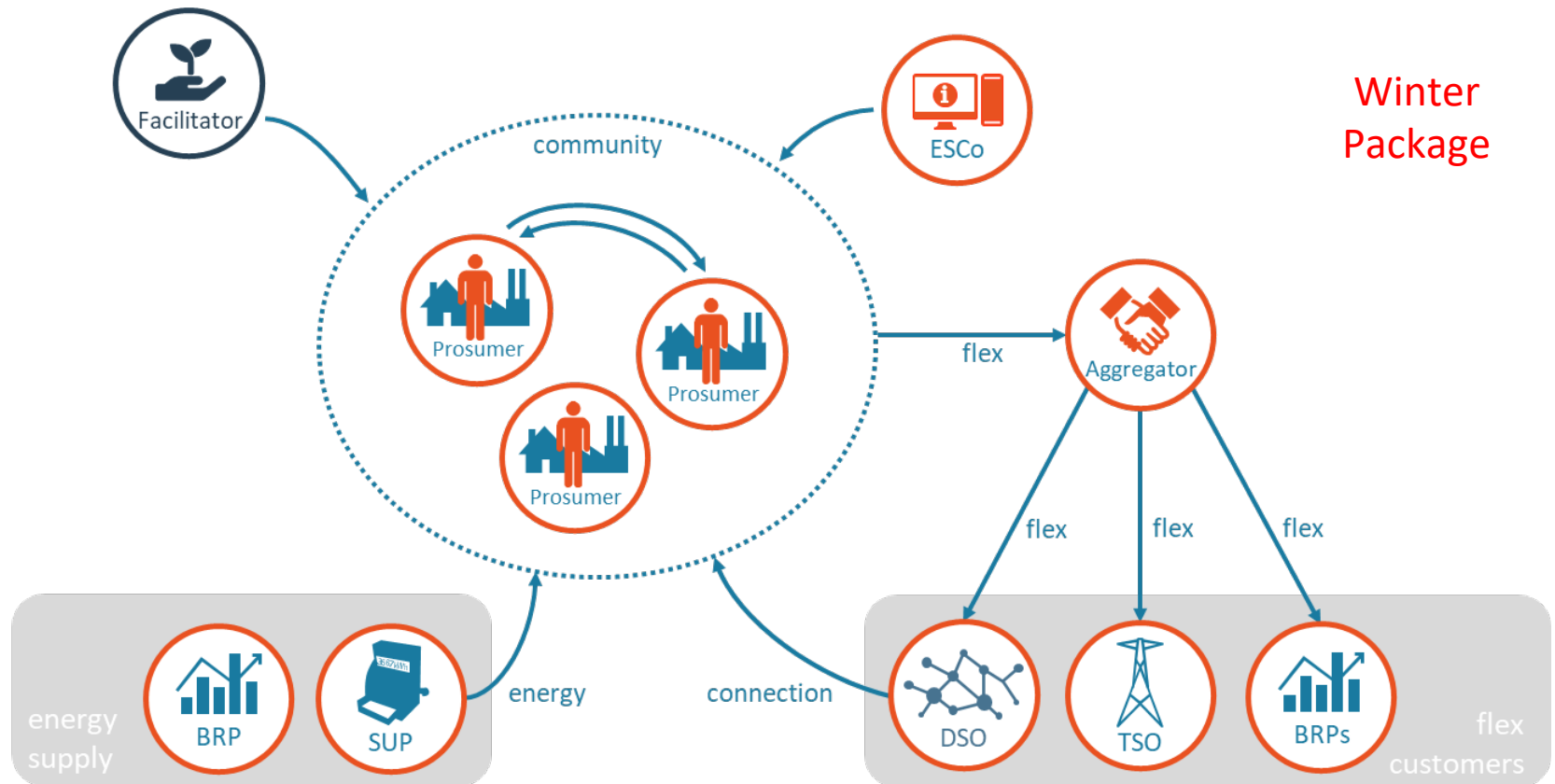
Limited opportunities, fixed prices, **individual** benefit



Mourik, Breukers, Summeren, Wieczorek, 2019  
Picture by Luc van Summeren

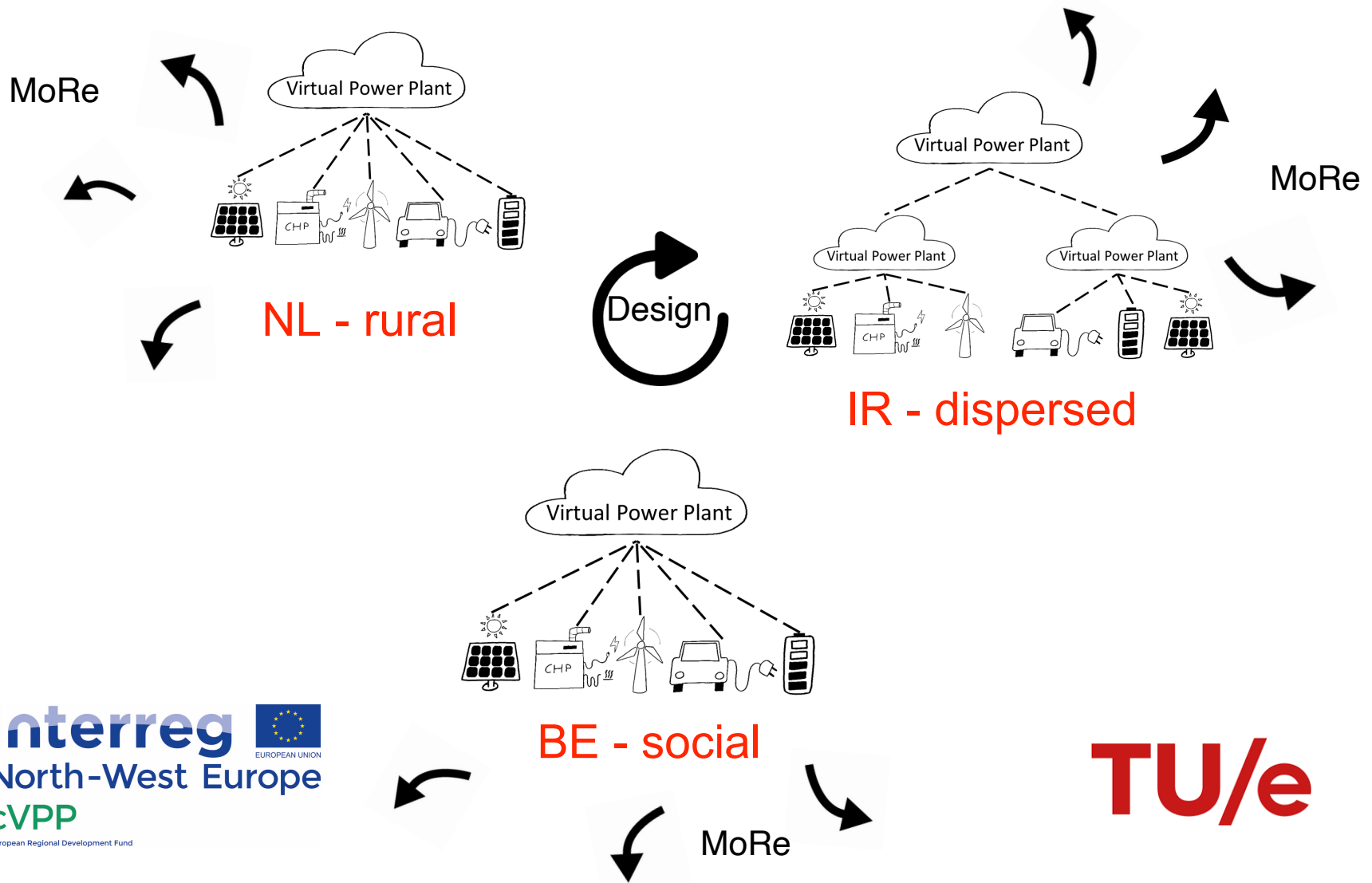
# cVPP roles in the **future** energy system

Creating **community** value through flexibility



# cVPP – it works!

Parallel transnational process



# Concluding

- cVPP - a community innovation that deals with the barriers of energy transition
- Radical socio-technical innovation that works
- Empowers & engages prosumers
- Potential to reorganise system towards more democratic, decentralised

<http://www.nweurope.eu/projects/project-search/cvpp-community-based-virtual-power-plant/>

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