

INFORSE-Europe - European Sustainable Energy Seminar,  
17-20 August 2021 - at the Nordic Folkecenter for Renewable Energy, Denmark

The distinct benefits of diverse citizen ownership models for onshore wind farms and district heating systems. Insights from Denmark and Sweden

By Leire Gorroño-Albizu  
18 August 2021

Proceedings: [https://www.inforse.org/europe/seminar\\_2021\\_INFORSE-Europe\\_DK.htm](https://www.inforse.org/europe/seminar_2021_INFORSE-Europe_DK.htm)

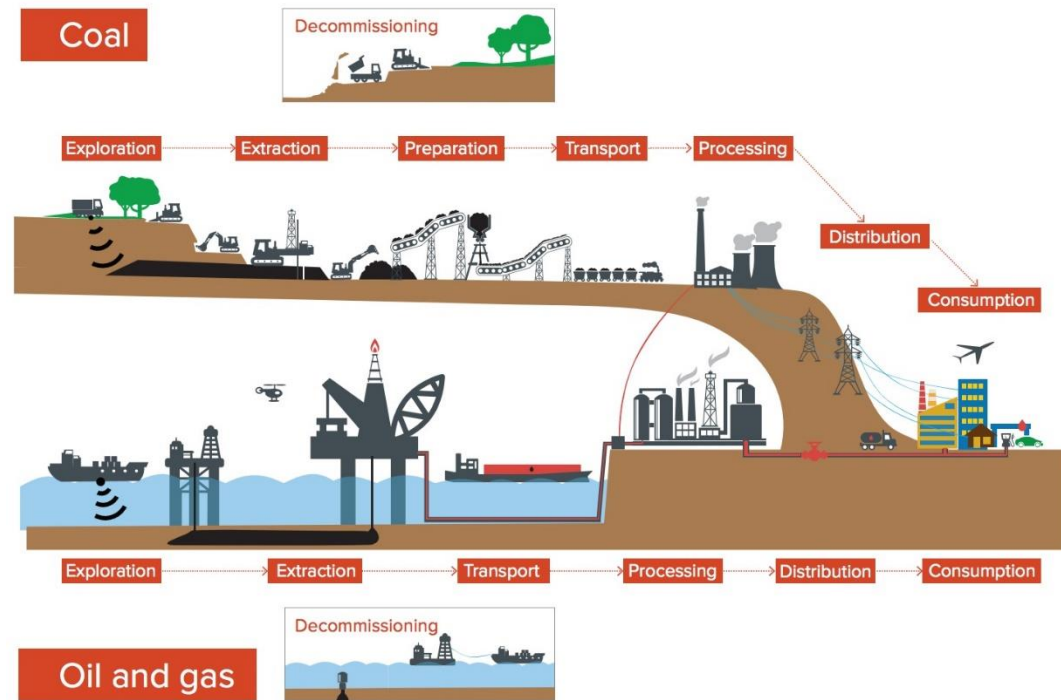
The **benefits and drawbacks** of different ownership models for the **energy transition**

with a special focus on the **diverse qualities** of **citizen ownership** models

# FOSSIL-FUEL BASED ENERGY SYSTEM

# RENEWABLE BASED ENERGY SYSTEM

Figure 1  
Value chain of production and consumption of fossil fuels (oil, gas and coal)



- Energy savings
- Energy efficiency
- Renewable Energy
- Low-carbon fuels and technologies

# What governance solutions do we want to implement?

- **New forms of actor participation and interaction** that are suitable to address the governance challenges of implementing and operating renewable based energy systems – **Maximise the energy system performance**
- Energy system performance is measured against **society's goals and users' expectations**

# New EU Directives

Renewable Energy Directive (Dec 2018) – ‘renewable energy communities’

Internal Electricity Market Directive (Jun 2019) – ‘citizen energy communities’

## **THE EU IS COMMITTED**

The EU supports the empowerment of its citizens in energy, be it through home-producing energy, energy cooperatives or municipal initiatives.

## What is 'community renewable energy'?

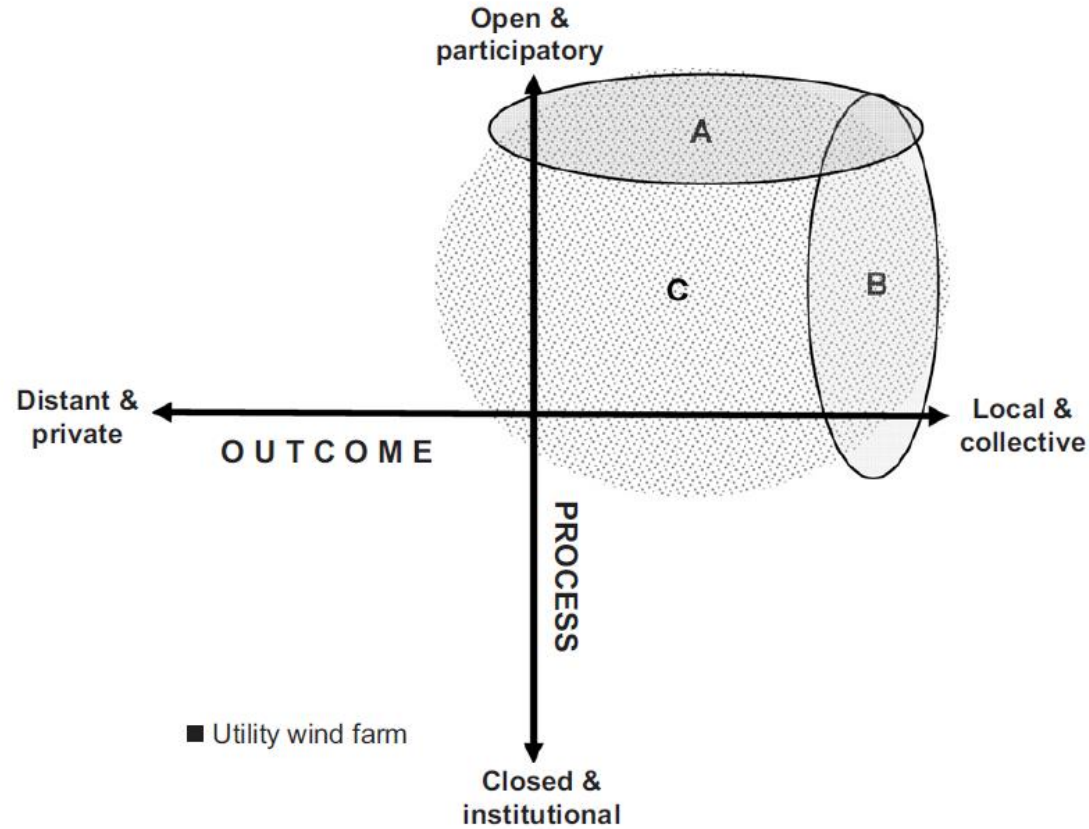


Fig. 1. Understanding of community renewable energy in relation to project process and outcome dimensions.

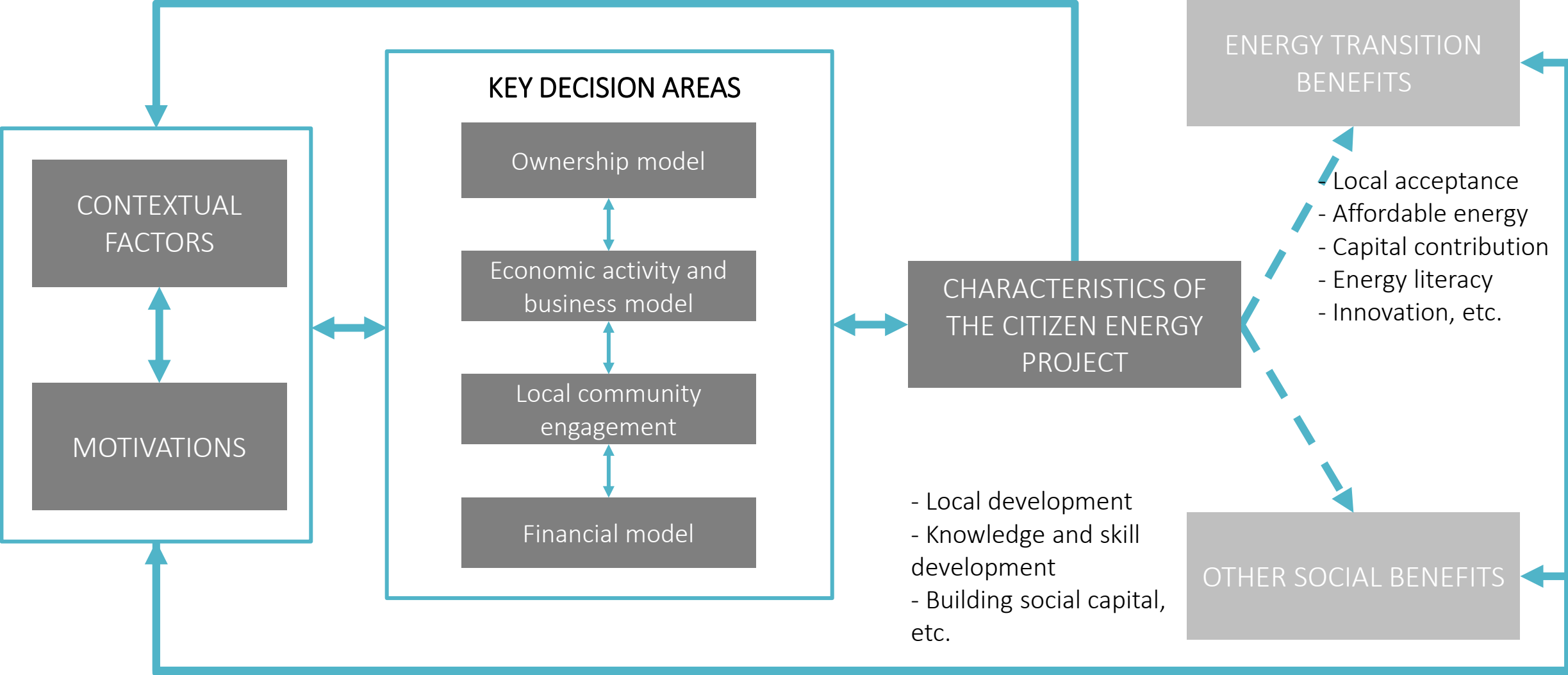
**Source:** Walker, G. and Devine-Wright, P. (2008) 'Community renewable energy: What should it mean?', *Energy Policy*, 36(2), pp. 497–500. doi: 10.1016/j.enpol.2007.10.019.

## 'Citizen energy' or 'community energy'

- Ambiguous concept
- Benefits and disadvantages?
- Changing socio-technical context

WATCH OUT!

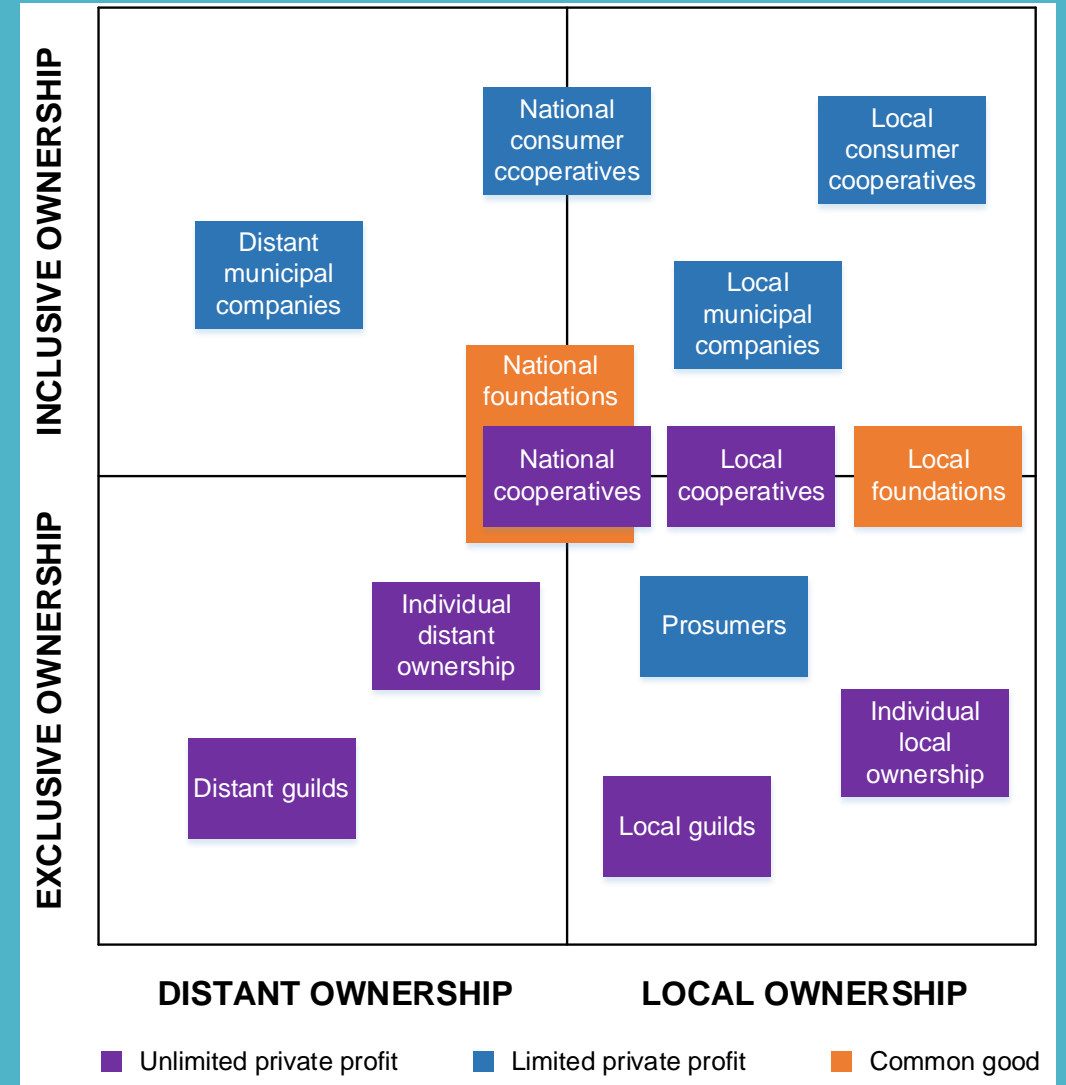
# The benefits of citizen energy projects



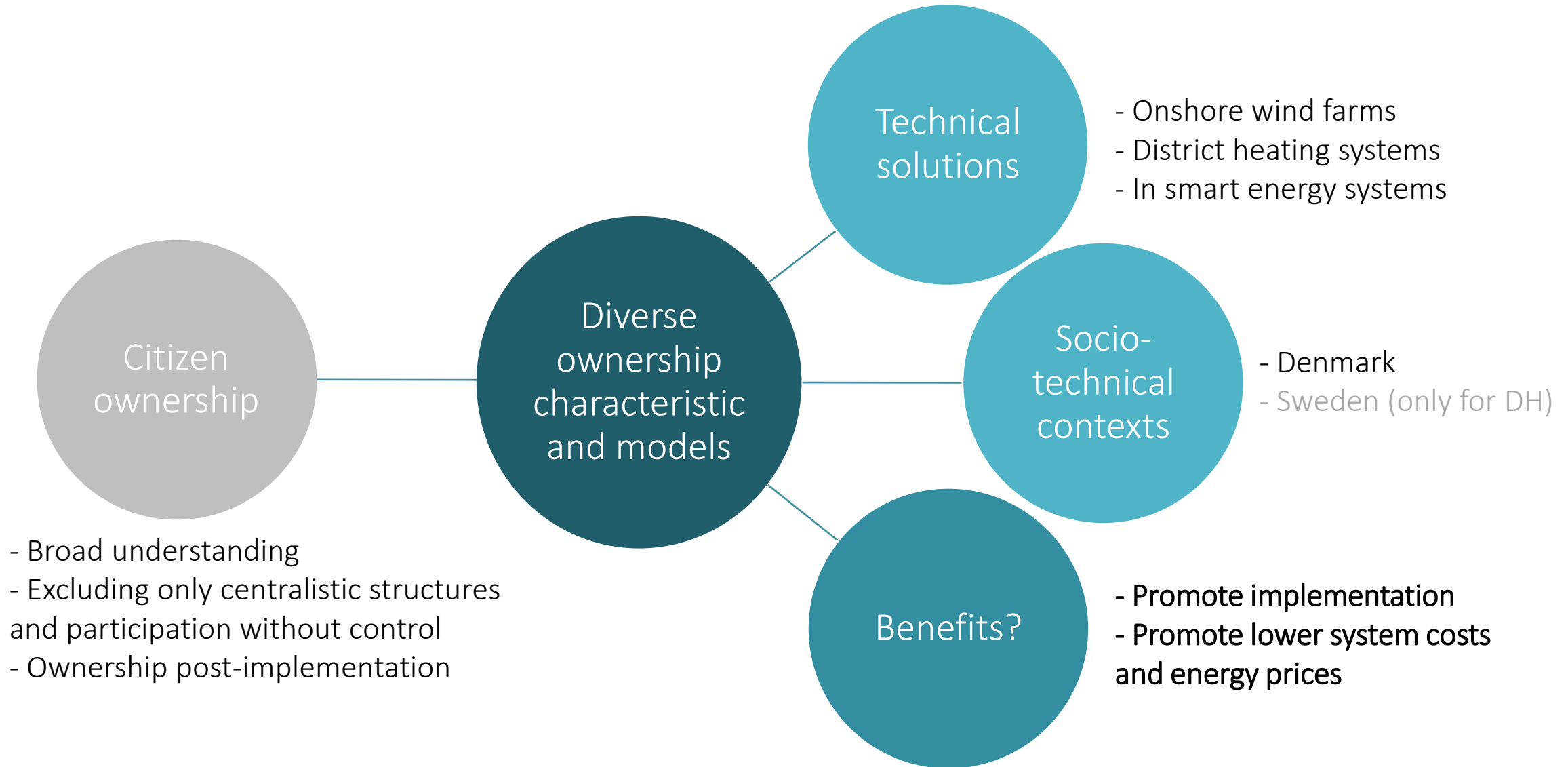


- Broad understanding
- Excluding only centralistic structures and participation without control
- Ownership post-implementation

## Characteristics of citizen ownership models









## Study 1:

Onshore wind turbine ownership in Denmark in 1977-2016: Capacity shares and ownership models for local acceptance

# Installed capacity by type of owner

## DOMINANT TRENDS:

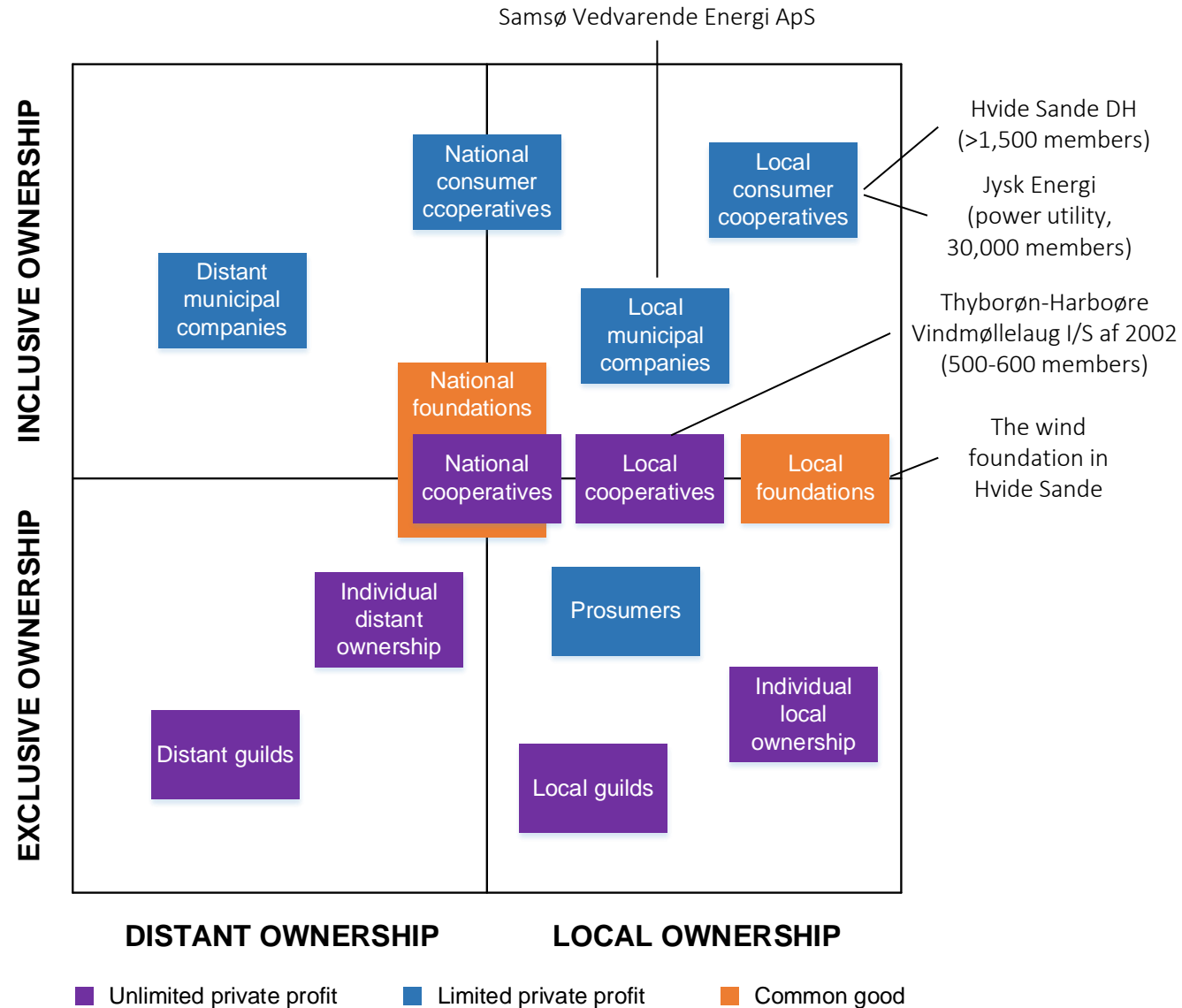
1985-1994: local & inclusive citizen ownership

1995- : exclusive ownership, commercial and citizen-owned

Since the implementation of the auction scheme, new citizen ownership has decreased to 10-11%!!

Data (2016)		
Wind share		37%
Total wind capacity		5,050 MW
Onshore wind capacity		3,782 MW
Citizen share of onshore wind ownership		68%
	Individual	30-57%
	Collective	11-38%

# Characteristics of citizen ownership models



- Local acceptance – Local & inclusive models
- Mobilise capital – All models

## Recommendations:

- Joint models – Local and inclusive models in combination with other models – BUT HOW?
- Local utilities (municipal companies and consumer cooperatives) – NEW TREND! – BUT HOW?



## Study 2:

DH ownership in Denmark and Sweden (1903-2020): Market shares and institutional conditions to motivate lower DH prices

# Market shares by type of owner

## Denmark:

- 64% households connected to DH
- Ownership (% of supplied demand):
  - 60% local municipal company
  - 34% local consumer cooperative
  - 6% commercial company

## Sweden:

- 51% households connected to DH
- Ownership (% of supplied demand):
  - 63% local municipal company
  - 18% joint ownership (municipal & commercial or state)
  - 12% commercial company
  - others: state, distant municipal, cooperative

# DH regulation

## Denmark:

- No DH regulation
- Strict DH regulation (1979-1999)
  - cost-based pricing
  - obligation to connect, remain
  - standard method for economic analysis of investments
- Slightly less strict DH regulation (2000s-)
  - transparency
  - exemptions for connection

## Sweden:

- Municipal regulation ( -1996)
  - cost-based pricing
  - local ownership
  - no electric heating in DH areas (1977)
- No DH regulation (1996-2007)
- Soft DH regulation (2008):
  - no price regulation – reliant on market competition
  - transparency and communication

# Fair institutional conditions for DH consumers

- Despite differences in regulations, we find:
  - High levels of local and inclusive ownership
  - The cost-based pricing principle is applied (63% of municipal companies in Sweden)
- High levels of ownership and communicative power – promote lower DH prices
  - Ownership: local consumer cooperatives and local municipal companies - internal pressure
  - Communication: publication of DH prices and other data (comparative evaluations), use of media
  - Neither the ‘free market’ approach nor the ‘strict regulation’ are effective on their own!





## Conclusions

- There are many citizen ownership models and many types of citizen energy projects
  - Not all will deliver the same benefits!
- **Project characteristics + contextual factors = Benefits of the citizen energy project**
- The study suggests that **local utilities** could be better at addressing the challenges of onshore wind farms and DH systems than other ownership models.
  - Local utilities – municipal companies and consumer cooperatives
  - Benefits – accelerate implementation and reduce system costs and energy prices

- Project characteristics = contextual factors (policies & regulations) + motivations
- The characteristics of an institutional context that promotes the realisation of the benefits of **local & inclusive** citizen ownership models are:
  - A legislation that secures openness of information (communicative power)
  - A market policy that supports local and inclusive citizens ownership - in single or joint ownership models

# Thank you for your attention!

Leire Gorroño-Albizu  
lgorrono@mondragon.edu



Drawing, by Anna Krenz