Learning from wind power: How to alleviate resistance to renewable energy solutions

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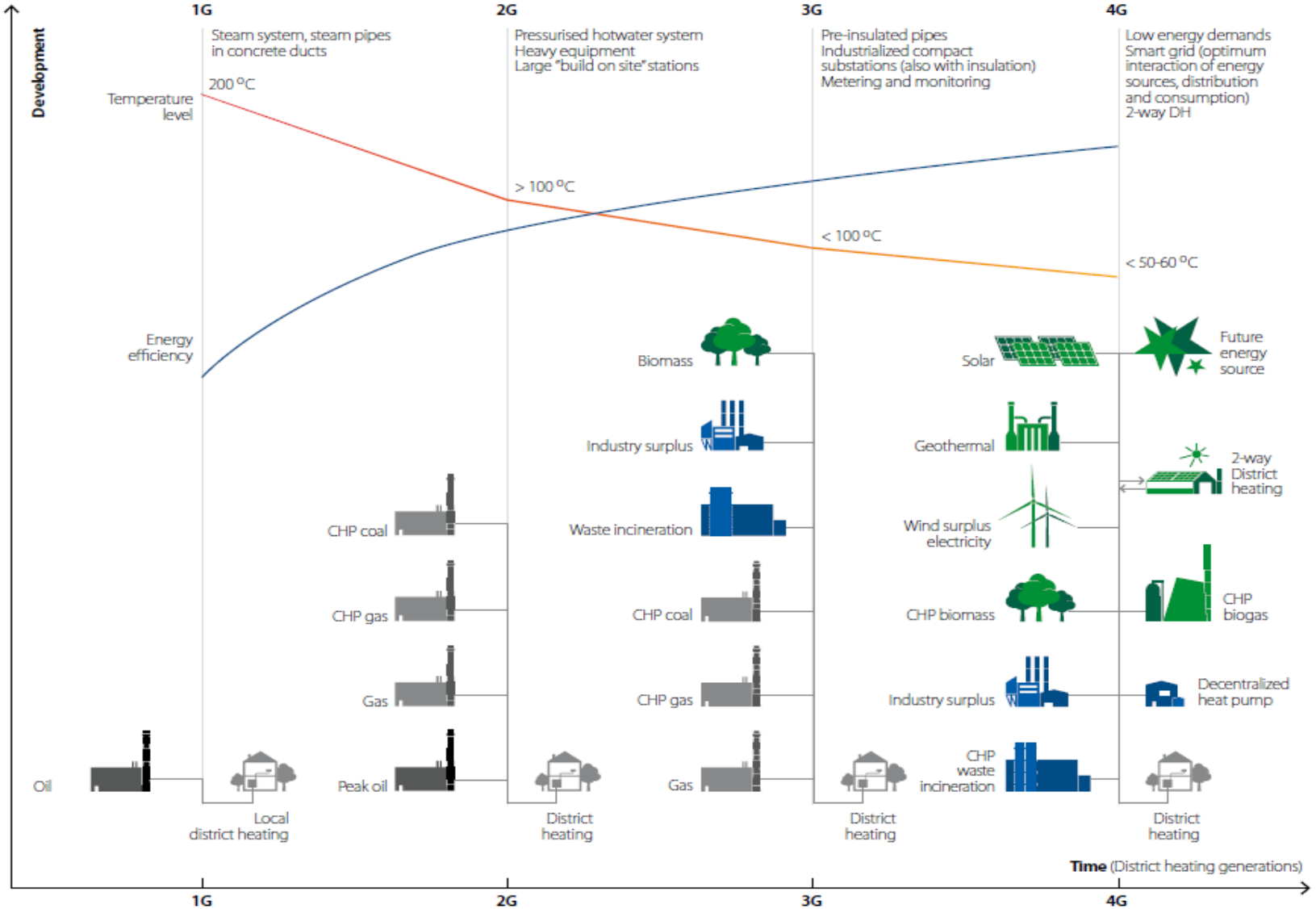
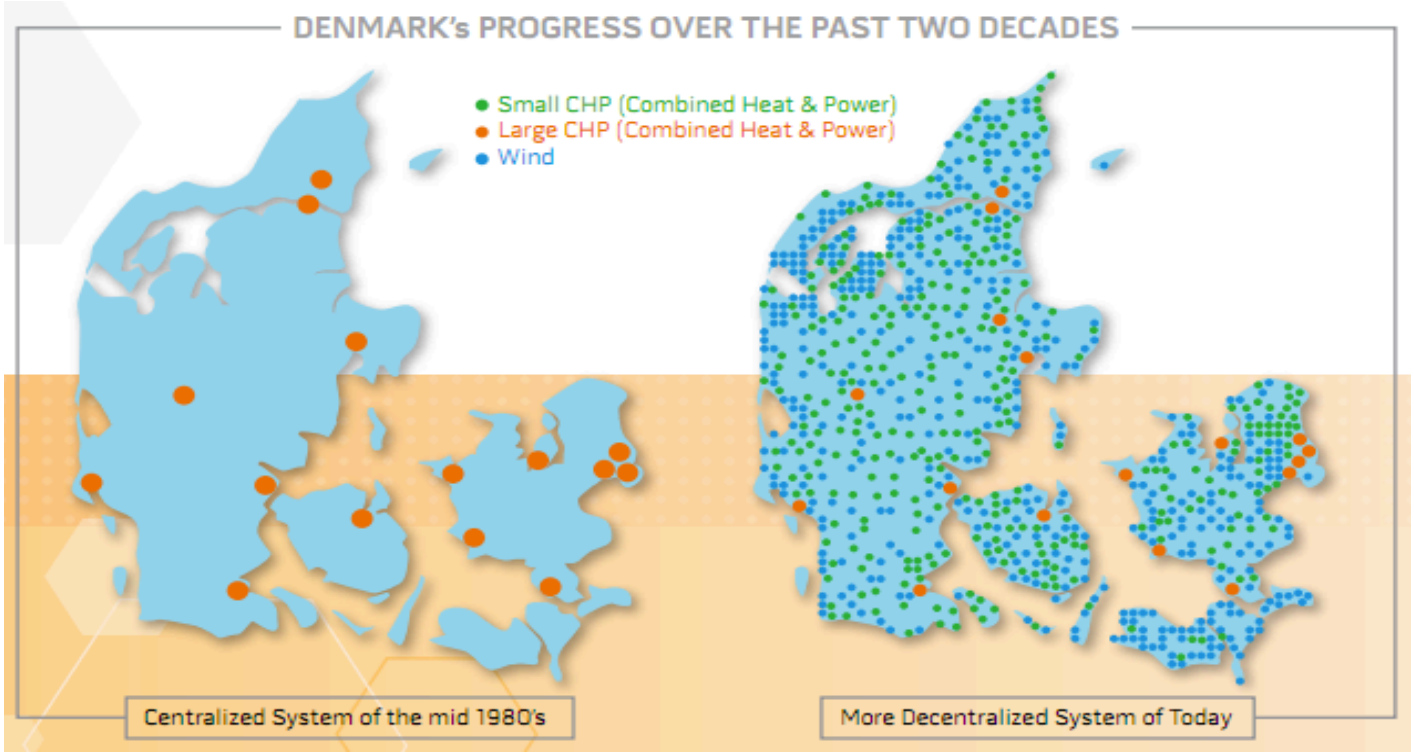
District heating from 1G to 4G

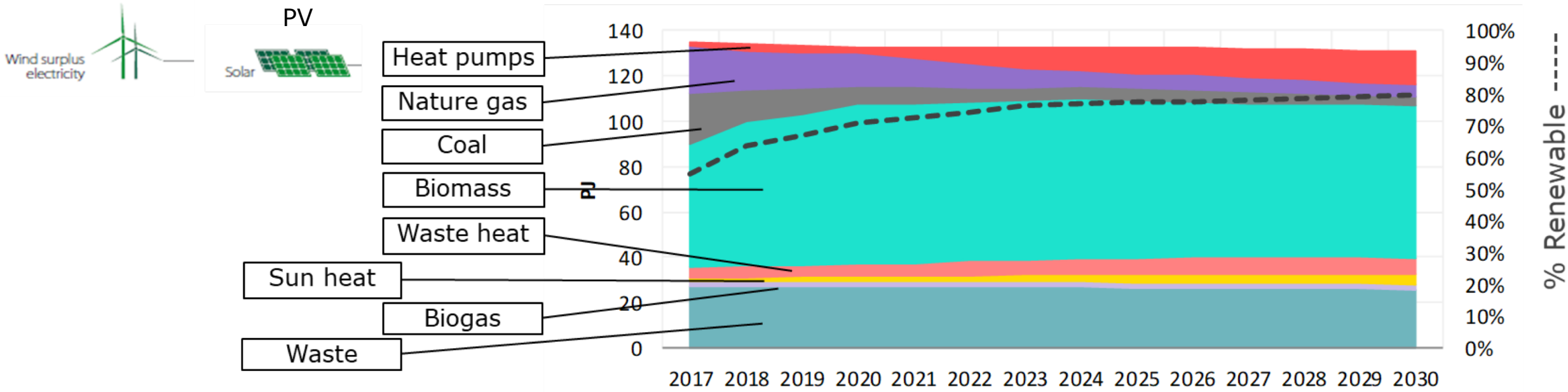


Danish District Heating Association

- 408 member representing 99% of national DH-supply
- Non-profit by law
- 63% of all houses in DK are connected to district heating
- 34 members are public utilities - supplying 49% of DH
- 356 members are private cooperatives owned by the consumers - supplying 51 % if DH



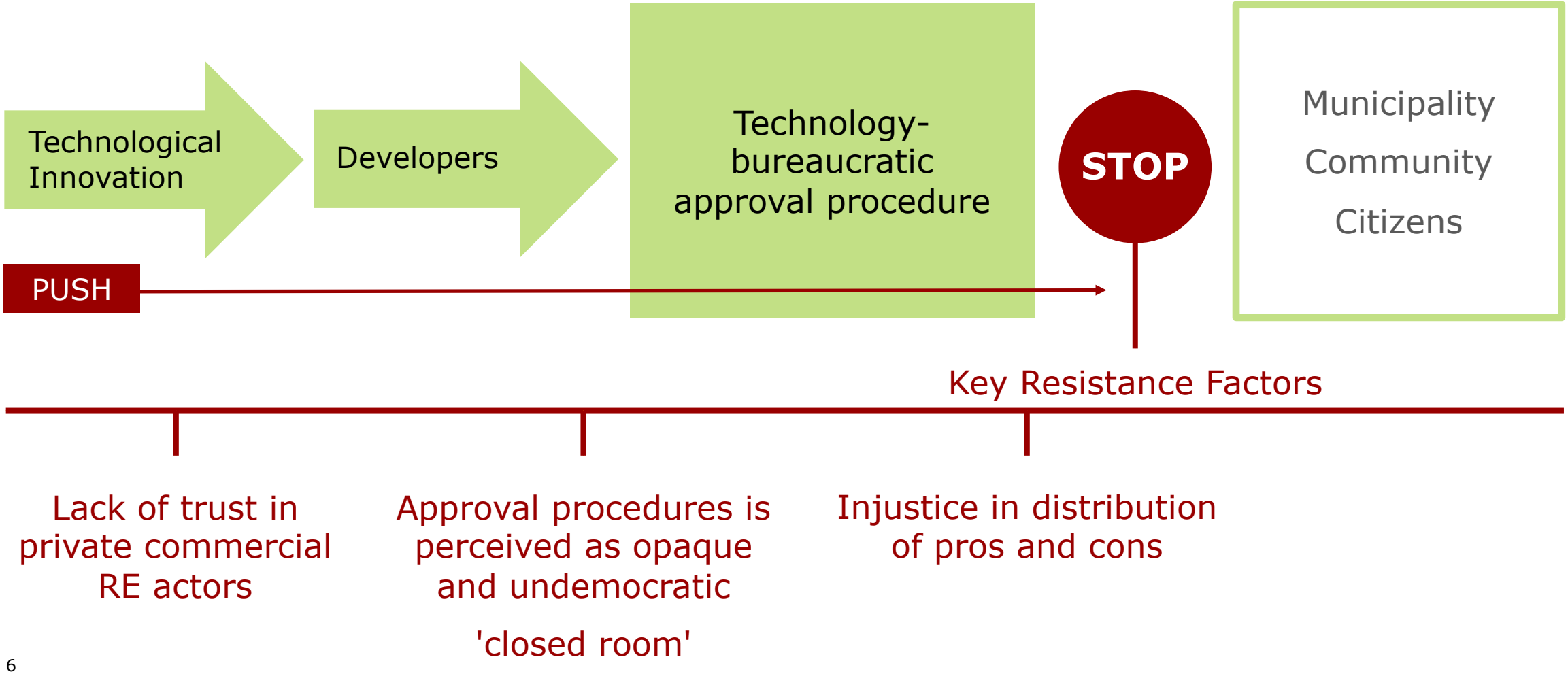
District Heat from Renewable Energy
Frozen Policy Scenario



Danish Planning Framework for Wind Turbines

- Planning authority for on-shore: The Municipality
- Planning authority off-shore: The National Energy Agency
- The National Energy Agency is the responsible authority for support schemes specified in the Renewable Energy Act:
  - Compensation scheme to neighbours for loss of property value
  - Co-ownership scheme where 20% shares must be offered to the local community
  - Municipality benefit scheme (green scheme)
  - Guarantee fund for local ownership initiatives

Community Resistance is Not About NIMBY



Green Transition is Jeopardized

2017 witnessed that local resistance stalled projects with a potential capacity of more than 300 MW on-shore wind power

127 MW	**80 MW**	**78 MW**	**20 MW**
Esbjerg	Harved	Kastrup-Tiset Enge	Øster Hassing Kær
West Jutland	South Jutland	South Jutland	North Jutland

Different Ownership Models: Commercial private, Public, PP-Partnerships

- A: The remote company (commercial) project model (corporate ownership)
- B: The enterprise model (local landowners & businessmen/utility)
- C: The true traditional Danish co-operative (broad local ownership 'vindmøllelaug')
- Hybrids: A/C, B/C, A/B/C
- D: The municipality investment approach

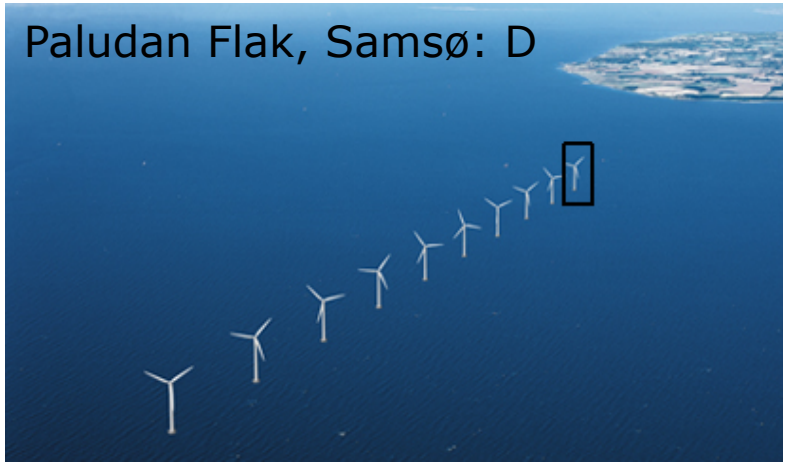
} Public private partnership

Local investment fund 80%

>400 citizens 20%

HoFor (Copenhagen Utility) 50%

>8000 citizens 50%



Samsø Municipality 50%

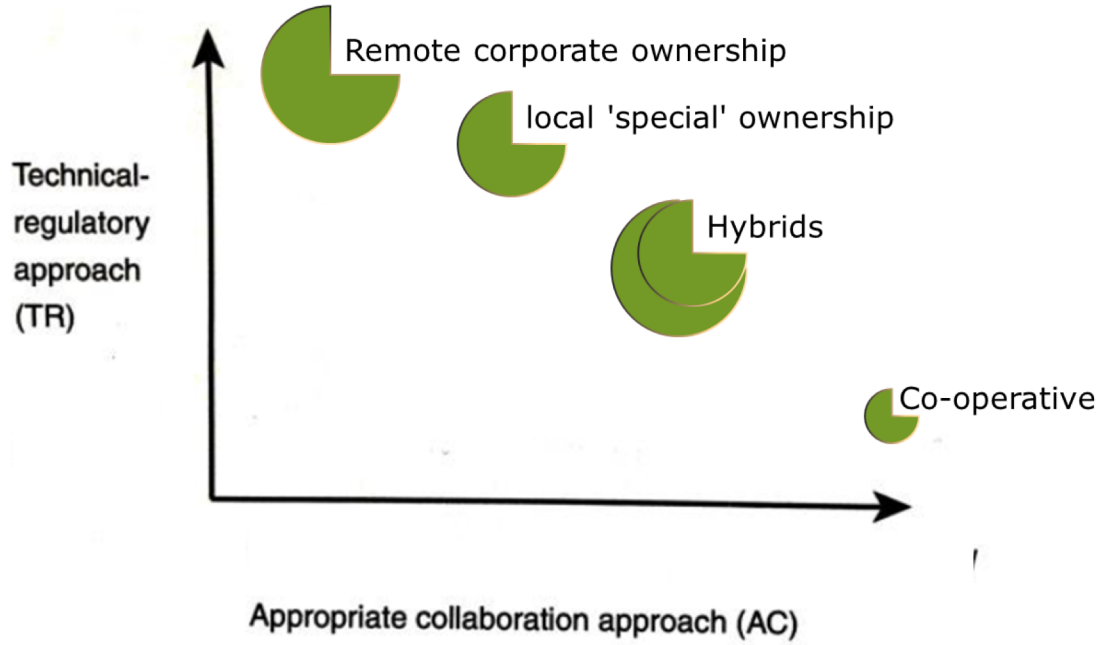
Private investors 30% [10% non local]

2 X legal partnerships 20%

Wind Parks and Natural Resource Decision Making Approaches

Focus is on *technical* solutions to problems and the perceived need for *regulations* to implement and enforce those solutions.

TR decision-making approach privilege agencies over communities and technical expertise over citizen input and traditional (local, indigenous) knowledge.



Focus is on frameworks and methods that emphasise authentic collaboration.

AC approaches emphasise access, dialogue, deliberation, mutual learning, and meaningful decision-space.

Walker, G., Daniels, E., Emborg, J., 2015. Public participation in environmental policy decision making. In The Routledge. Eds. Anders Hansen, A., Cox, R., Routledge Handbooks Online

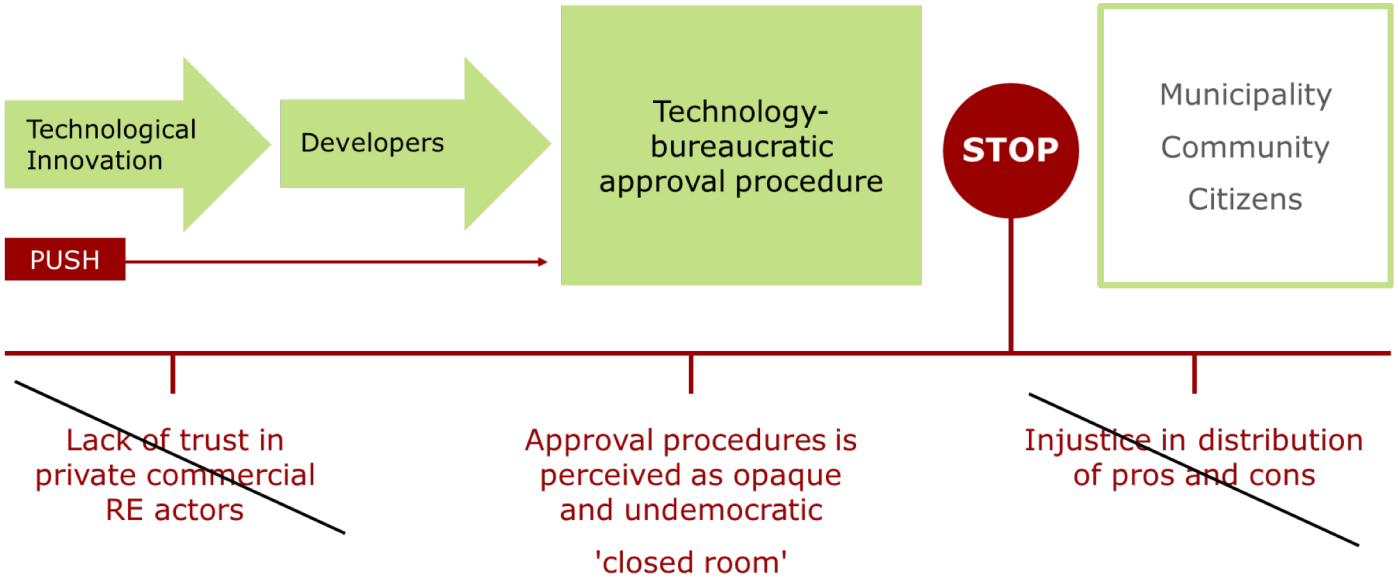
The Exception that Proves the Rule, Sun heat

- Protests: Insignificant
- Ownership: Non-profit and owned by consumers/municipality
- Hybrid: C/D

- Sejling Hede; Silkeborg Forsyning
- Area: 156.694 m^2
- Calculate anual production: 80.000 MWh
- Percentage of total need: 20%
- Commisioned: 2016
- Lifespan: Minimum 25 years

Conclusion

Danish District Heating Association non-profit model amend two of three key resistance factors



A new approach to a planning framework based on citizen engagement