The University of Manchester
Sustainable Consumption Institute

# Socio-technical analysis of electricity transitions, applied to UK and Germany: Internal niche momentum and regime lock-in

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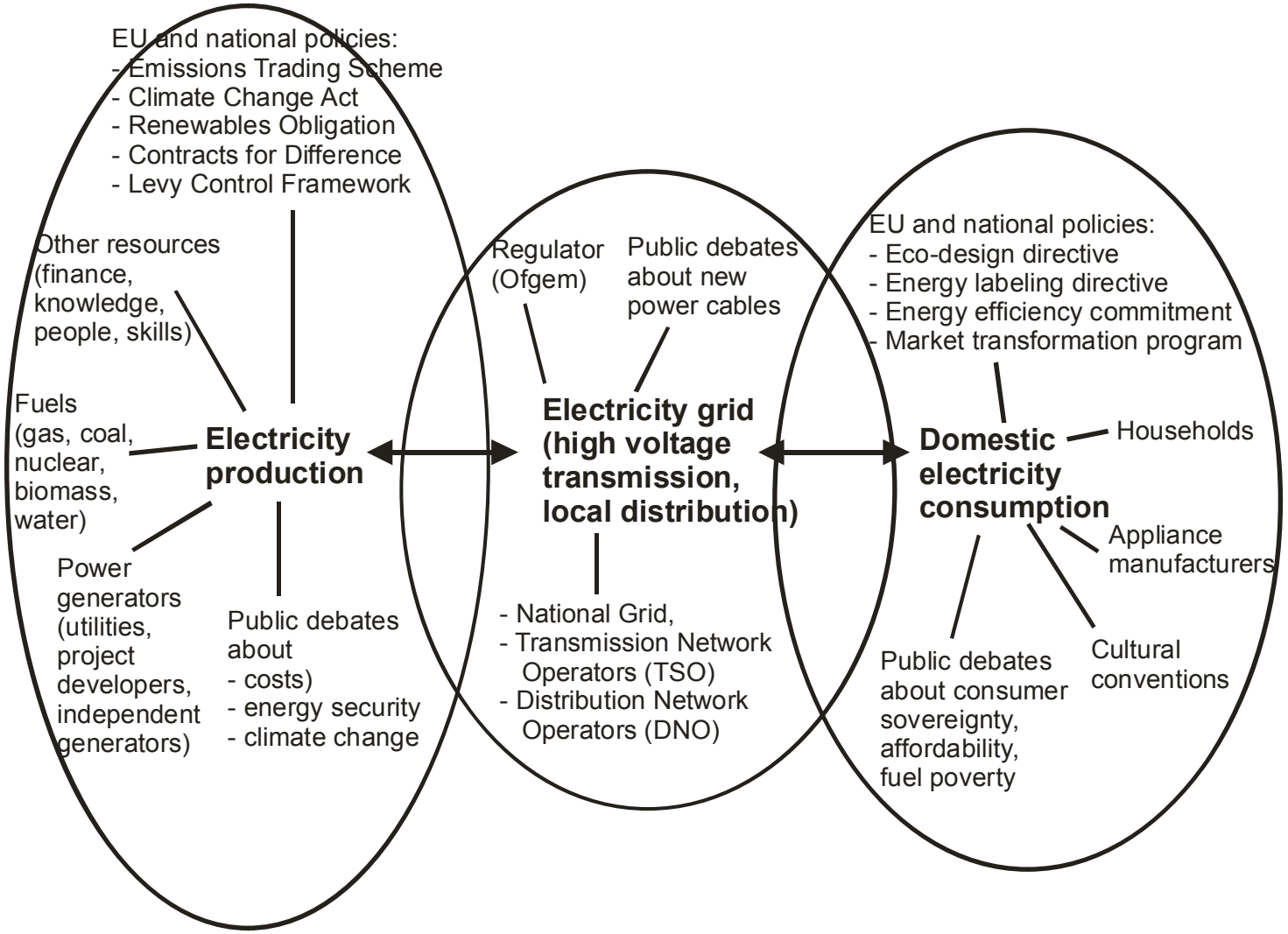
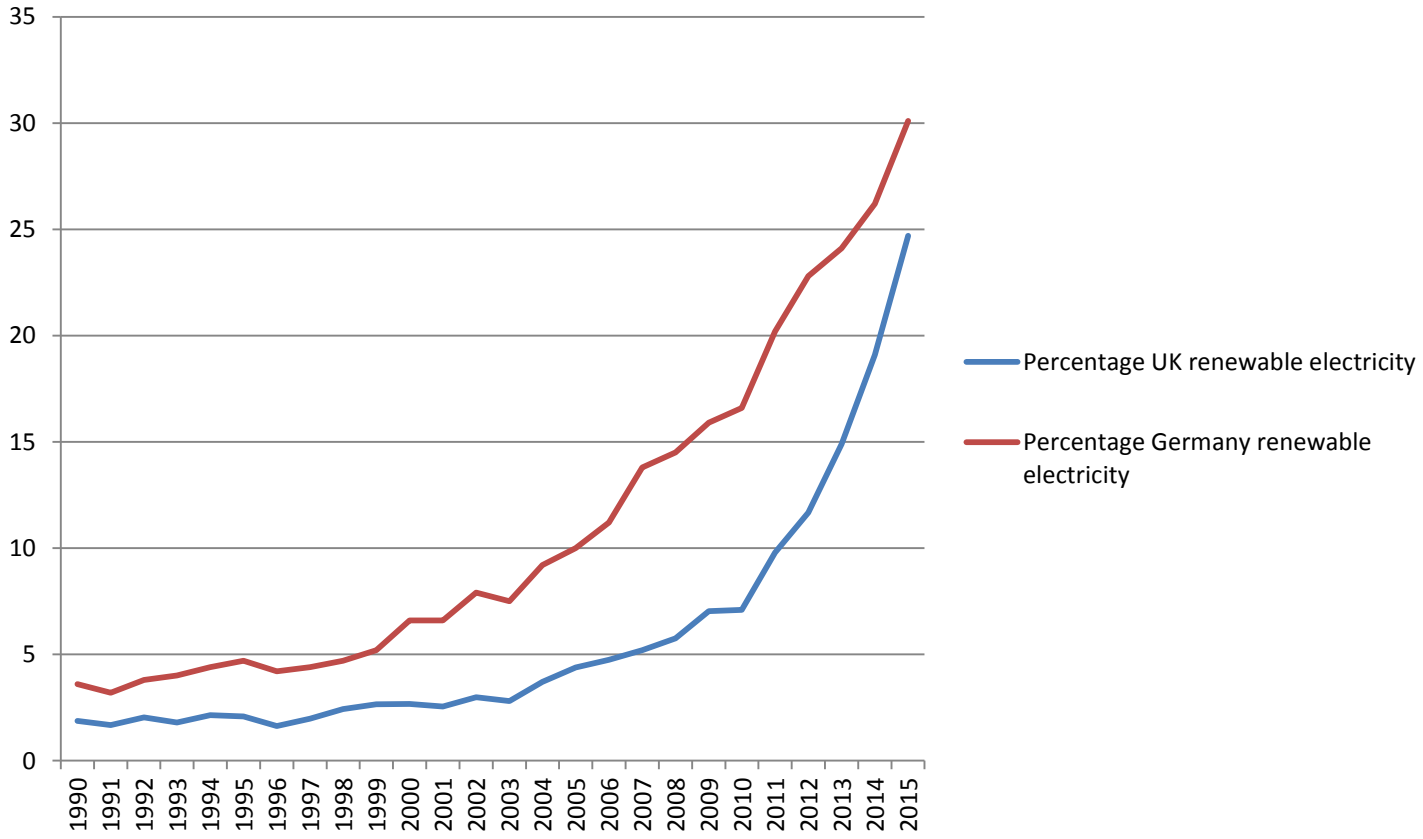
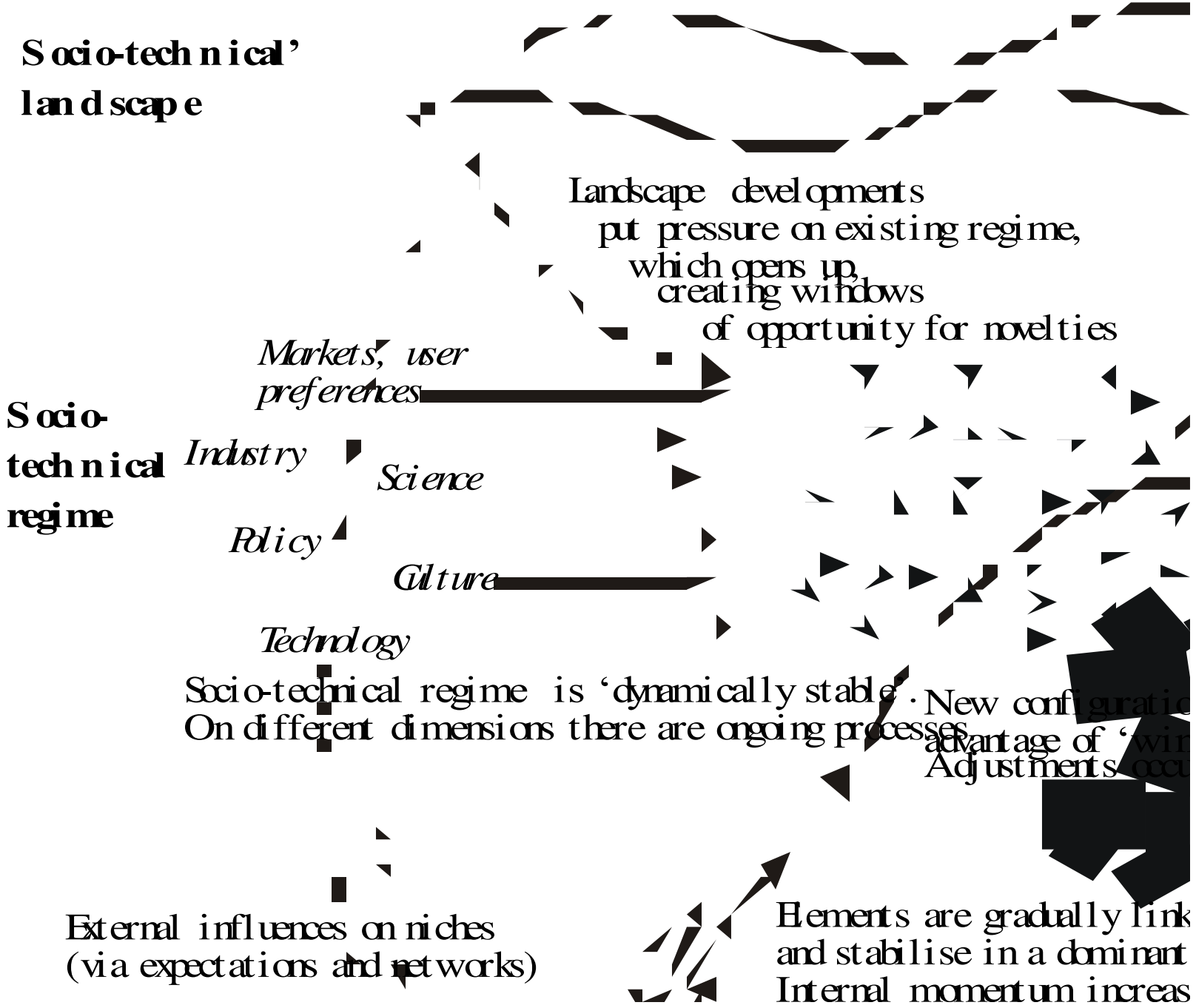
# Socio-technical system in electricity



# Renewable electricity expansion in DE and UK: 30.1% and 24.7% in 2015




Looks similar, but very different underlying patterns in RET-deployment


Socio-technical' landscape
Landscape developments put pressure on existing regime, which opens up, creating windows of opportunity for novelties
Markets, user preferences
Socio-technical regime
Industry
Science
Policy
Culture
Technology
Socio-technical regime is 'dynamically stable'. On different dimensions there are ongoing processes
New configuratio
advantage of 'win
Adjustments occu
External influences on niches (via expectations and networks)
Elements are gradually link
and stabilise in a dominant
Internal momentum increas

# Research strategy

- Assess internal momentum of 6 niche-innovations

a) techno-economic

b) socio-cognitive

c) Policy and politics

- Assess degree of lock-in/stability of existing regimes (continued investments, actor commitment, policies, economic performance)

# Results

- In-depth case studies (reports/deliverables)

D2.1. Momentum of niche-innovations

D2.2 Stability of existing regimes

D2.3 Integrated socio-technical assessment

D2.4 Comparative analysis UK and DE

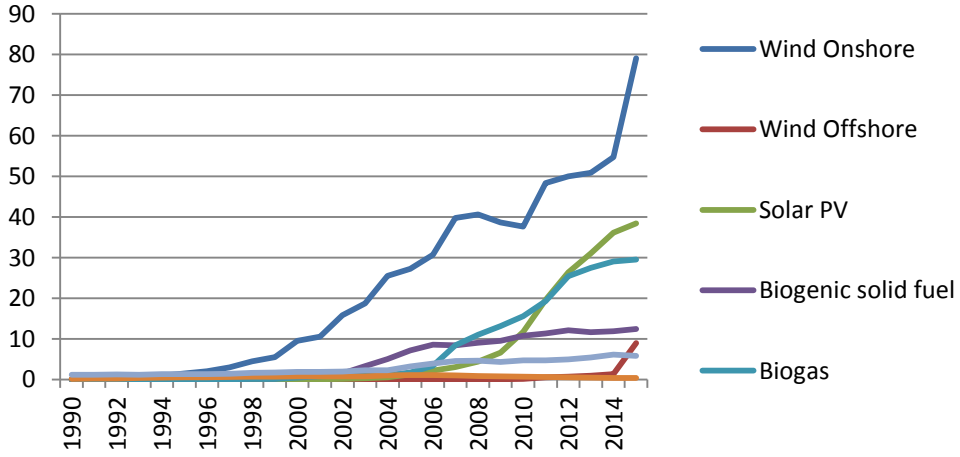
D2.5 Socio-technical scenarios

- General assessments

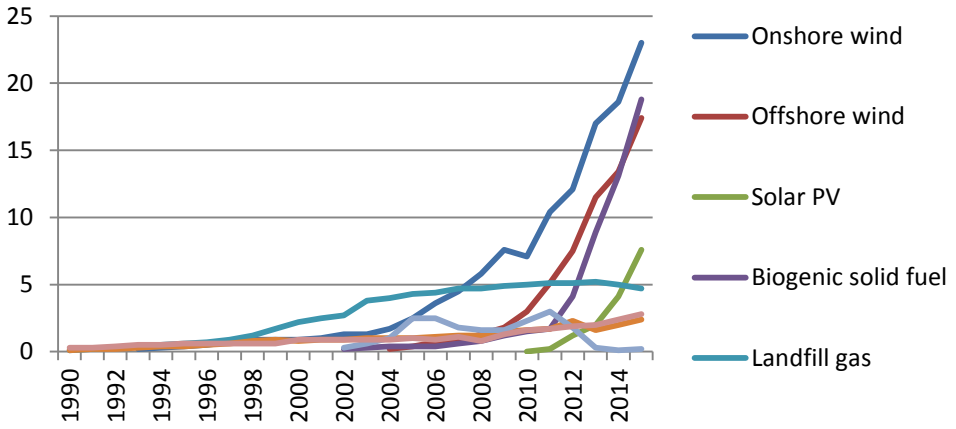
# Internal momentum of niche-innovations

| | Pathway A | | Pathway B | |
|---|---|---|---|---|
| **Germany** | CFL and LED lighting: | High | Onshore wind: | Very high |
| | Offshore wind: | Medium | Solar-PV: | High |
| | Smart meters: | Low | Bio-energy: | Low |
| **UK** | CFL and LED lighting: | Very high | Smart meters: | High |
| | Offshore wind: | High | Solar-PV: | Low |
| | Bio-energy: | Medium | | |
| | Onshore wind: | Medium | | |

**DE more on pathway B**




**UK more on pathway A**



# Stability and tensions in existing regimes

| | Lock-in, stabilizing forces | Cracks, tensions, problems |
|---|---|---|
| **German electricity generation regime** | Weak | Strong |
| **German electricity networks regime** | Moderate | High |
| **German electricity consumption regime** | Moderate/strong | Moderate |
| **UK electricity generation regime** | Strong/moderate | Weak/moderate |
| **UK electricity networks regime** | Strong | Weak |
| **UK electricity consumption regime** | Strong | Weak/moderate |

# Conclusions

Germany:

- **Pathway B**: new entrants replace incumbents (leading to strong regime tensions)
- Rapid RET expansion requires grid expansion, which faces social acceptance problems
- Substantial societal engagement ('bottom-up'), but concerns about costs and downfall of incumbents ('too big to fail') weakened government support (reduce EEG, auctions)

UK:

- **Pathway A**: incumbents gradually reorient towards RET, causing less tensions (except for coal phase-out)
- Grid transformation mostly incremental, due to strong lock-ins
- Less societal engagement; more top-down, technocratic; transition costs highly politicized, leading to major reversals and slow-down