# Towards a framework for assessing niches' sustainability potential

Noam Bergman
eceee Summer Study, June 2011

Niches & sustainability

• The mainstream paradigm has struggled with sustainability such as CO_2 emission reductions.

• Thinking outside the box is needed. Innovative niches outside the mainstream can help.

• Market niches and technological niches: new products/services or those with a small share

• Transition theory niches: sub-systems; a network of actors with some differences from the mainstream regime.

The Multi-level Scheme
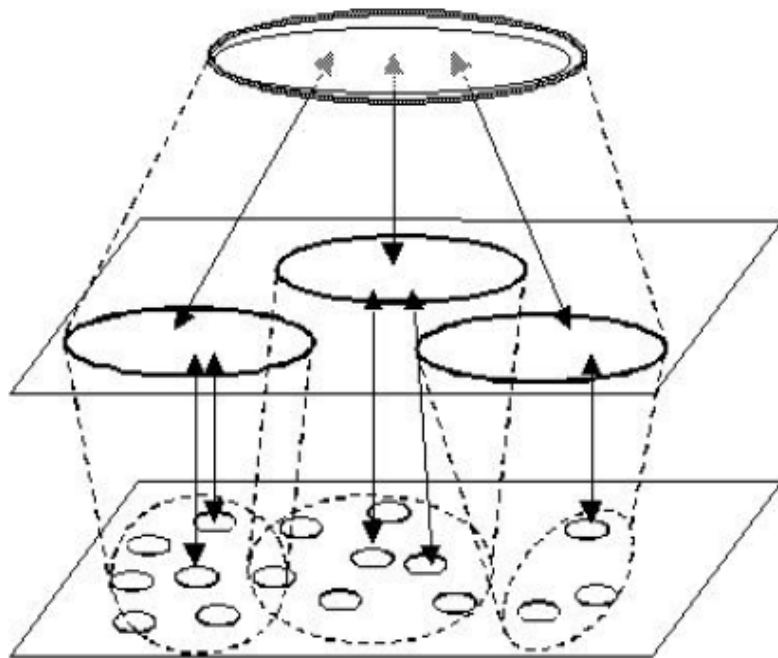
Macro-level = Landscape

Meso-level = Regime

Micro-level = Niche

Niches

- Regimes are locked-in to trajectories of social and technical development – limited by investment in infrastructure, vested interests, cultural norms...

- The focus is therefore on optimisation rather than innovation or system change.

- Innovation for sustainability requires systemic change, with new ideas coming from niches.

- But which niches should be supported? How can they be compared to each other?
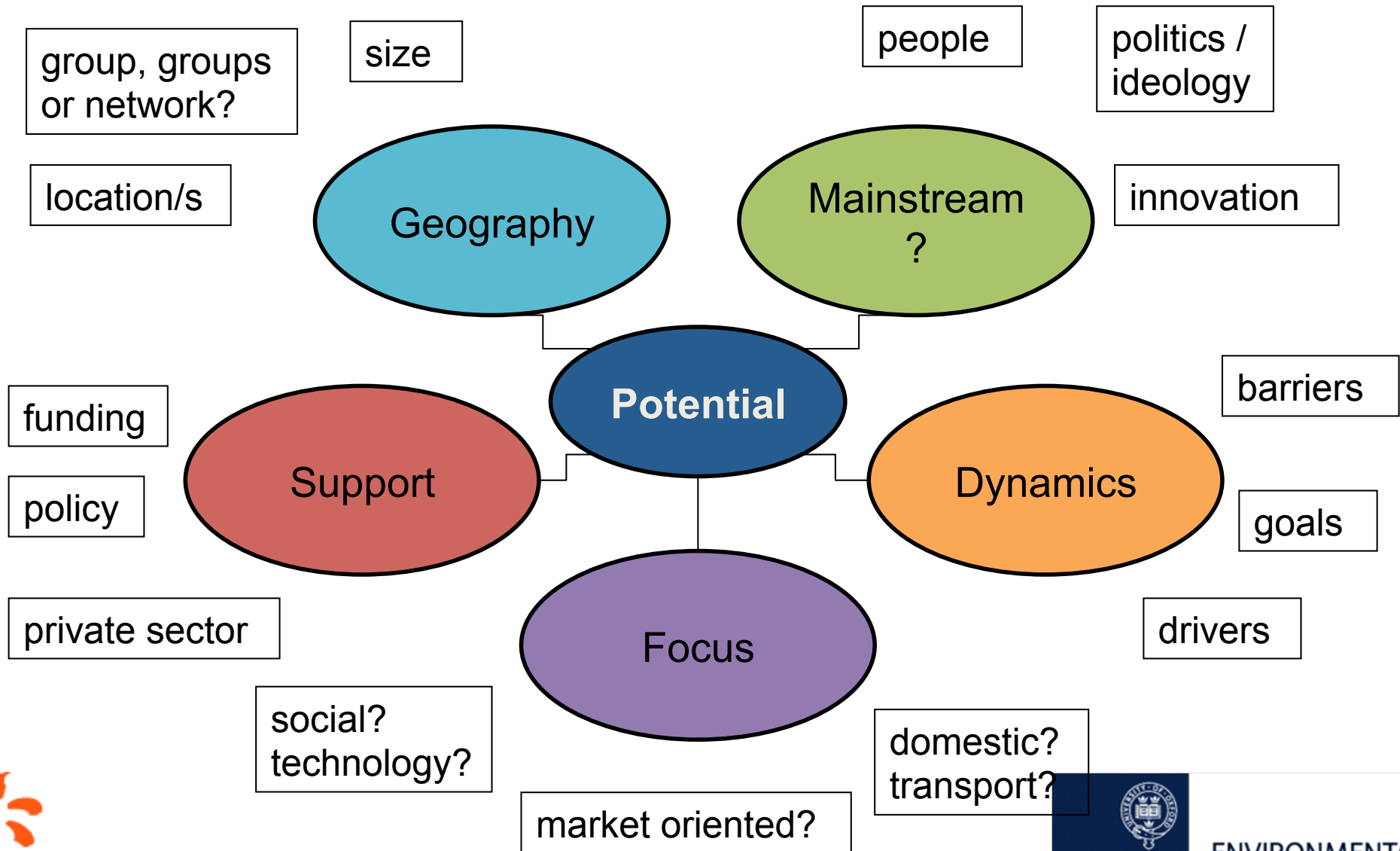
Framework for niches (1)

- There is no overall framework for comparing niches.

- Different technological innovations are often compared to each other to some degree.

- Technological innovation and social innovation are not – separate in policy and research.

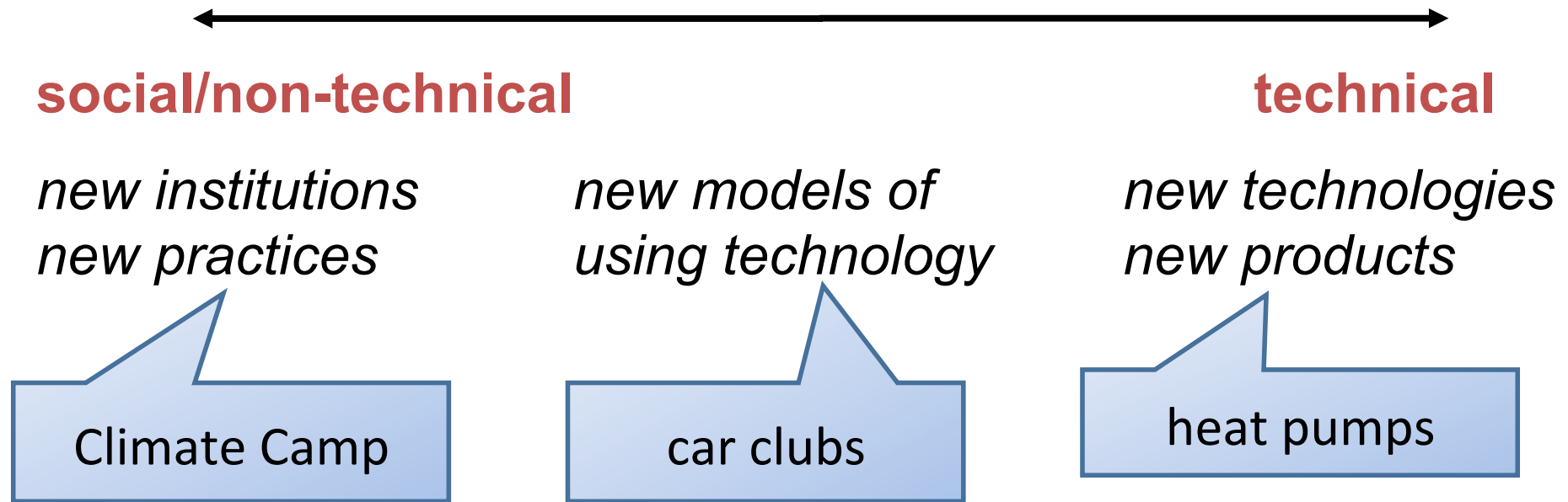- Methodical assessment of social niches is lacking.

Framework for niches (2)

- This work is the beginning of a framework for a typology of niches and an assessment of potential to advance or catalyse sustainability.

- The methods and choice of parameters will be refined in an iterative manner, e.g. according to measurability, importance and relevance.

- Not just statistics about the niche: look at dynamics such as motivations of niche actors and the niche's drivers and barriers.

- Ultimately assess sustainability potential under different policy options

Thoughts on framework (v0)

Case studies

social/non-technical   technical

new institutions   *new models of*   *new technologies*
new practices   *using technology*   *new products*

| Climate Camp | | car clubs | | heat pumps |

Three case studies chosen: sustainability relevant niches that are very different in their focus, politics etc. Literature reviews and interviews used to build a profile of each niche.

eDF ENERGY

UNIVERSITY OF OXFORD · ENVIRONMENTAL CHANGE INSTITUTE

Climate Camp

Climate Camp

- A niche working towards radical social and political (systemic) change – or part of a larger niche?

- Radical analysis and critique of capitalism and politics of power, which were put into action in running the camps.

- New to interviewees, or really innovative?

- Empowering participants, creating networks

- Effect beyond the camp? Unclear.

- Surprise decision to dismantle – February 2011.

Climate Camp - legacy

- Heathrow 3rd runway; Kingsnorth CCS decisions.

- Interviewees felt Climate Camp had 'Opened up political space' for more radical ideas and actions by more mainstream groups.

- "... an organisation that, most agree, changed the way the UK talked about climate change."
  – Bibi van der Zee, the Guardian.

Domestic heat pumps

- Electric heating systems, basic types are ground source (GSHP) and air source (ASHP).

- A few thousand of each in the UK, growing niche

- Energy policy is main driver.

- A variety of barriers – technological, cultural, institutional.

- Recent EST trial suggests low HP efficiency.

- Savings highly dependent on carbon intensity of grid and energy efficiency of house.
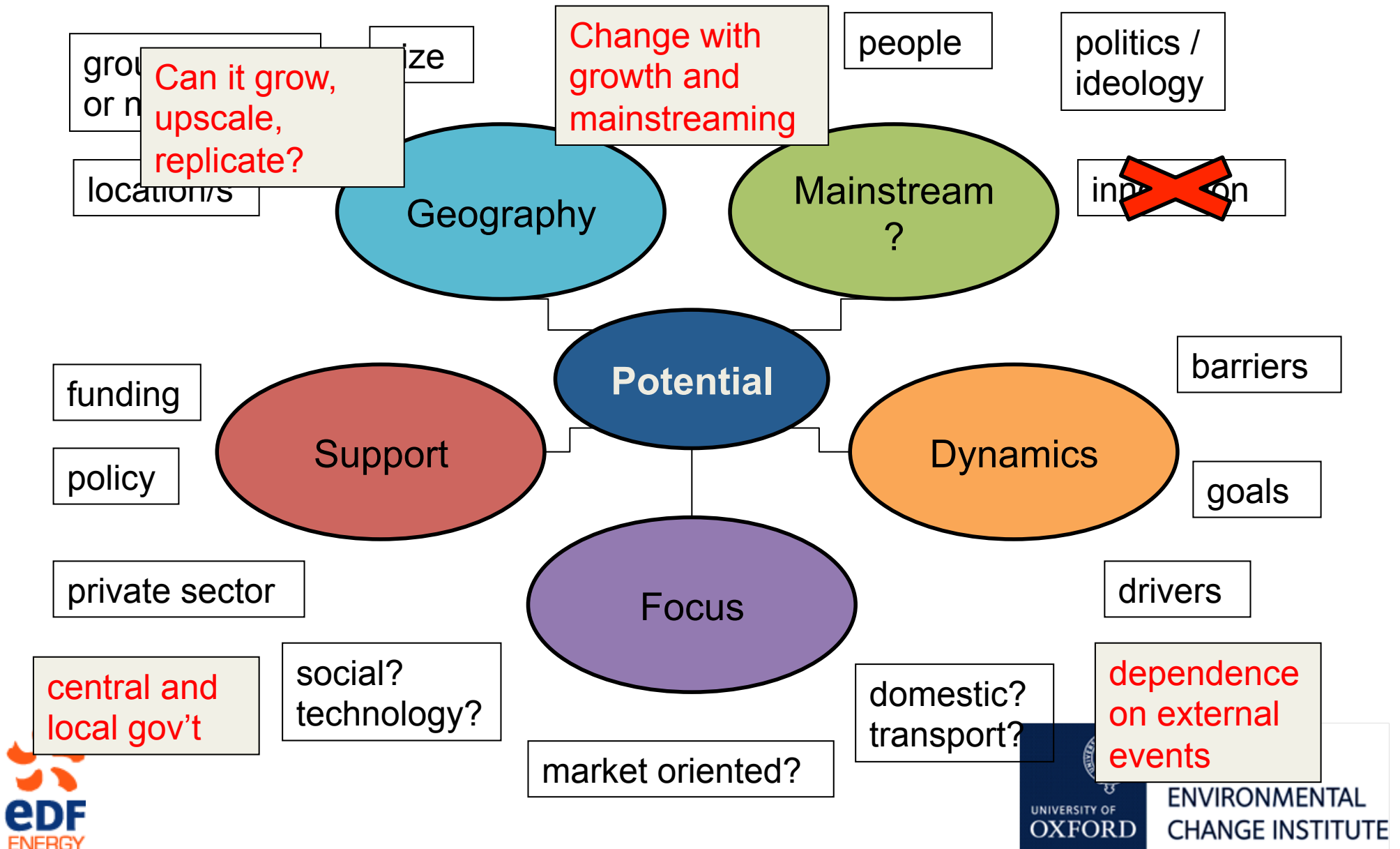
Car clubs

- 160,000 members 3,000 cars (January 2011) and growing rapidly.

- Over 400 locations in the UK, 80% in London.

- Originally grassroots, breaking norms of car ownership with community schemes.

- Now local authorities and public transport companies involved, larger clubs run as commercial ventures

Car clubs: CO2 emissions

- Reduced mileage: Studies in Europe found over 65% reduction among those who *gave up their car*. For all members estimated 30-50%.

- Members defer buying cars or sell them. Each club car represents over 20 privately owned vehicles that were sold or not purchased.

- Club cars are ~25% less polluting than average.

- Spillovers: car club members are more likely to use public transport and slow modes.

Thoughts on framework (v1)

grou[...] [...]ize

Can it grow, upscale, replicate?

location/s

Change with growth and mainstreaming

people

politics / ideology

inn[...]on

Geography

Mainstream?

funding

policy

Potential

barriers

Support

Dynamics

goals

private sector

Focus

drivers

central and local gov't

social? technology?

domestic? transport?

dependence on external events

market oriented?

UNIVERSITY OF OXFORD — ENVIRONMENTAL CHANGE INSTITUTE

eDF ENERGY

Classification

Niche	Heat Pumps	Climate Camp	Car Clubs
Domain	domestic energy	systemic change	transport
Focus	new technology	radical social change	technology focused social change
Geography	individual, unconnected users; small supply chain	network of local and regional groups	variety of small and large clubs; most in London
Size	medium (thousands)	medium (thousands)	large (160,000+ UK members)
Ideology / Politics	weak: users environmentally aware; supply chain purely business-oriented	strong: (originally) explicitly anarchist, anti-state, anti-capitalist	mixed from small voluntary schemes to large corporate; some 'green' users
Economics	business oriented sector	entirely voluntary	larger clubs business oriented, support from public actors
Top-down / Bottom-up	mostly bottom-up	strictly bottom-up	middle-out
Behaviour	users have a slightly 'greener' attitude than the mainstream	very far from mainstream; behaviour and attitude change among participants	slight deviation from mainstream; behaviour change among participants
Mainstream / Radical	mainstream	radical	borderline

Assessment

Niche	Heat Pumps	Climate Camp	Car Clubs
Internal dynamics	There is an industry push to grow, but lack of skilled installers, inconsistent quality of installations and poor information to consumers might are barriers to growth.	Ideology is the main driver. Growth has caused tension between more radical old guard and some less radical newcomers. Some have left due to burn out, but there are plenty of new volunteers. Process is burdened by number of people	Small ideologically driven car clubs have been largely overtaken by large, commercial ones. Cooperation between the private sector, local authorities and public transport helps growth, but this is inconsistent across the UK.
External dynamics	Main drivers are financial and regulations supporting microgeneration as part of wider energy policy goals. Barriers include low public awareness; conservatism in domestic heating sector; lack of suitable technology for refurbished houses.	Relationship with mainstream is complex and sometimes antagonistic; mixed relationship with the media; difficult to get the message out.	Lack of funds, lack of political support and limited cooperation with transport and local authority actors act as major barriers. Public interest is limited.
Potential for growth	Reasonable. Hundreds of thousands of houses are potential users, perhaps millions, but significant changes both inside the niche and outside are necessary for this.	Very limited in its current form. Internal institutional change might allow some increase, but significant growth would probably require dumbing down the politics, which would change the nature of the niche.	Significant. Studies suggest 9-15% of the UK population could become members, i.e., several million people, with minor infrastructure change. Alignment with emissions reduction and other goals could draw government support.
Benefits	Significant energy savings in the domestic sector.	Demonstration of alternative, sustainable living. Empowerment of participants. Opening political space for public discourse on the environment.	Emissions reductions and potentially reduced traffic with implications for congestion and air quality. Indirectly, car clubs could aid transport, community and lifestyle change sustainability goals.
Dependence	The niche is fairly independent, but emission savings are highly dependent on the carbon intensity of the electricity grid, and the energy efficiency of the house	Operates independently, but is linked through its participants to a variety of groups in the social change movement.	An independent niche; benefits maximised where cooperation exists with public transport companies and local authorities.
Potential emissions savings	Household space and water heating produce average emissions of 3-4 tonnes CO_2. Decarbonised grid with efficient HP and heating system could reduce it significantly. Number of households with space for HP is unknown.	Very difficult to estimate. Potential is mostly as part of a larger network for social change leading to lower emission lifestyles. Another (extremely unlikely) possibility is as a catalyst for radical political change to a much lower carbon economy.	A rough estimate of 1 tonne CO_2 per member per year, with estimates of 5-9 million potential members in the UK. Indirect benefits hard to estimate.

Thoughts on electric vehicles

• Car clubs and EVs are very different niches which offer emissions reduction in personal mobility and car use. How do they compare?

• Huge investments in EVs: £30m to start installations of electric car charging points. £43m in grants in 2011 (£5,000 per car).

• Currently a few thousand in the UK. Climate committee calls for 1.7m EVs by 2020 – considered optimistic.

Car clubs & Electric vehicles

	car clubs	electric vehicles
focus	product-service shift	new technology
politics	sustainable consumerism	'great electrification'
size	over 160,000 members	~3,000 cars + other actors
growth potential	significant with little change	significant with investment
support	local government, central policies; small investments	central gov't and private sector; large investments
barriers	cultural, institutional, political;	technological, infrastructural, institutional
CO_2 reduction	~1tonne CO_2/yr /member	~1tonne CO_2/yr/car
CO_2 potential	high with small investment	high with large investment
other	behaviour change to more sustainable mobility	dependent on larger, decarbonised grid

Conclusion (for now)

- Current policy does not support niches according to their sustainability potential
- Methodical assessment of niches' potential is needed, especially for social niches
- Niches positioning relative to the regime/ mainstream could be crucial.
- Interaction with the regime determines both the *likelihood* of mainstream uptake and how the niche might *change* when it grows.
- Level of innovation is not the most important.