What future for the energy-rich Scottish North? Changes in the economic landscape of the Highlands and the Isle, and the rest of Scotland

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Agenda

1 Introduction and Objective
2 Megalopolis
3 The Conundrum
4 DICEP
5 Case Studies
6 Conclusions & Next Steps

Power-rich Waters

- **Potential**: 44 to 80 GW of wind, tidal and wave;
- **Technology**: 2 COTS (wind+tidal), strike price by 2017; 1 COTS by 2017, s.p. by 2020 (wave);
- **Scope:** 100% Scottish power by 2020; reduced foreign dependency; major manufacturing potential;
- **Location:** Majority of potential in Highlands and Islands region (HIR) waters.

Courtesy of: Wikimedia Commons

Objective

‘To overcome the current conundrum generated by the economic paradigm implemented in the Highlands and Islands Region (HIR), thus enabling the transition to a low-carbon economy’

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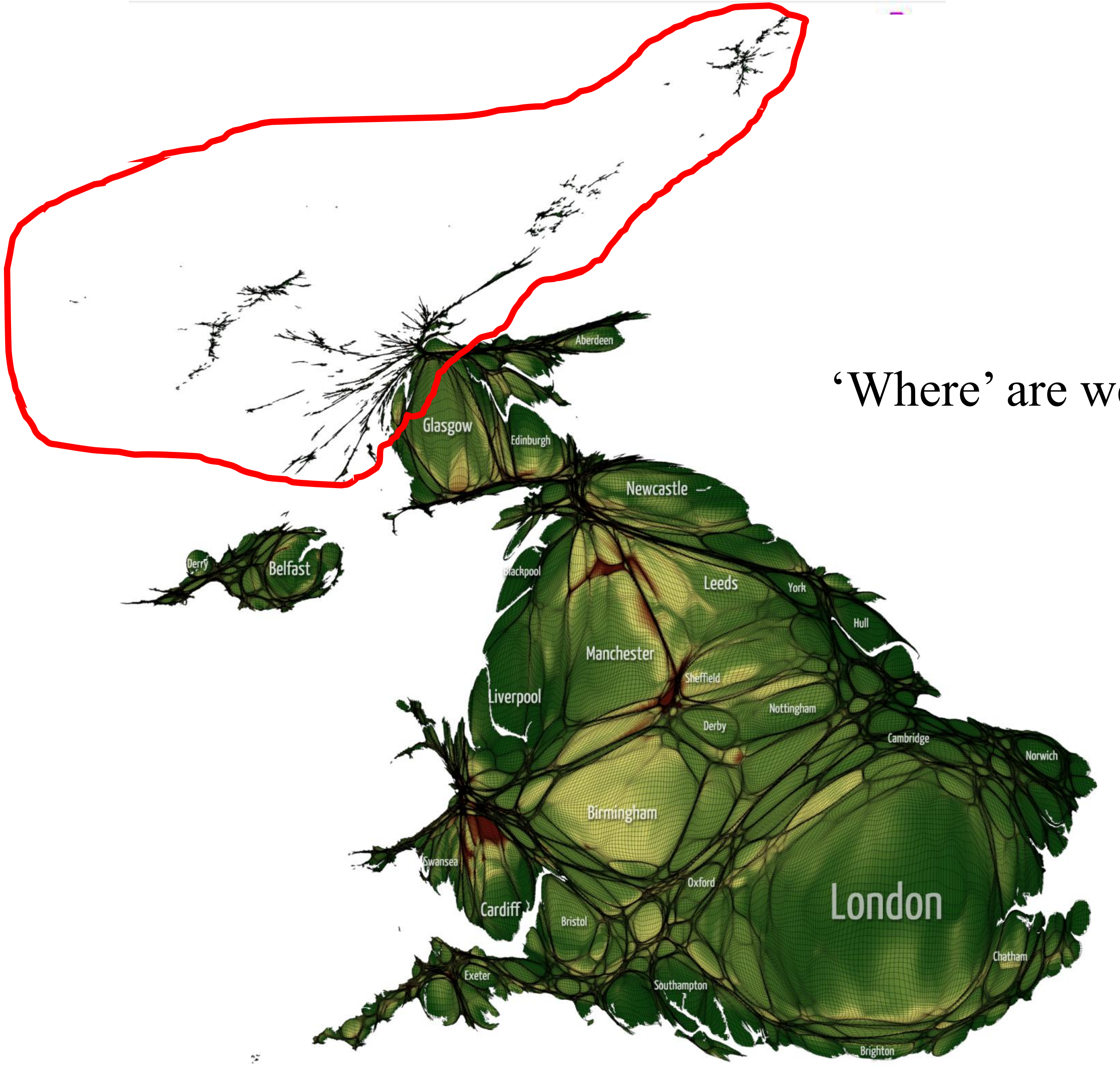


‘Where’ are we talking about?

Courtesy of: World Mapper

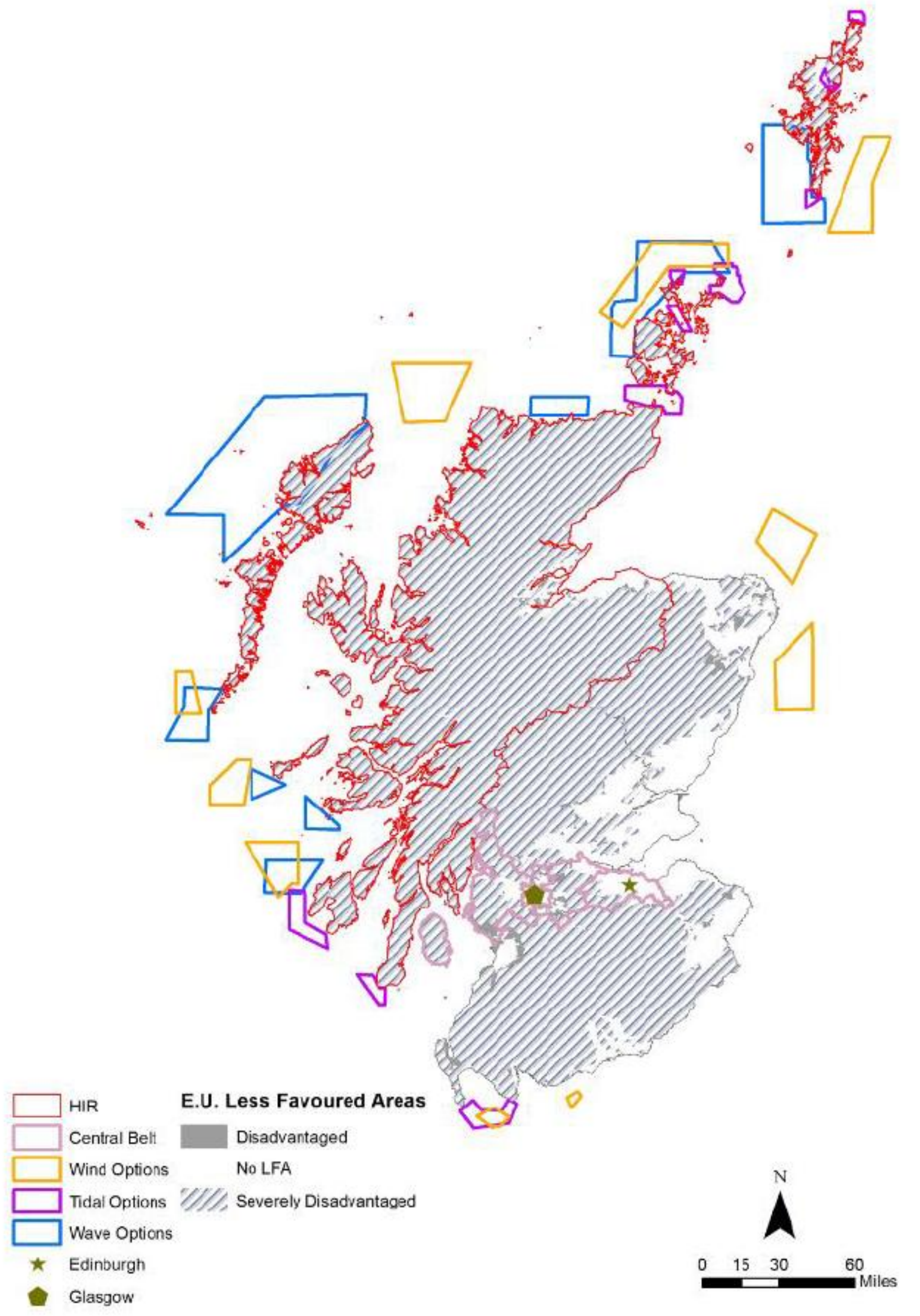


Figure 1 – Map of Scotland with Identified Potential Site for MREs, and Less Favoured Areas[3]

Courtesy of: World Mapper

Megalopolis: the Concept

- **<u>Origin of the Term</u>: Megacities are‘[…] cities or urban agglomerations (including so-called larger urban zones) with more than 10 million inhabitants […]’ (von Goslow et al., 2013).**
- **<u>Megalopolis</u>: Larger urban conurbation influences vast portion of the interior and the surrounding coast.**
- **HIR influenced by 2 Regions: Central Belt and London.**

Courtesy of: Wikimedia Commons

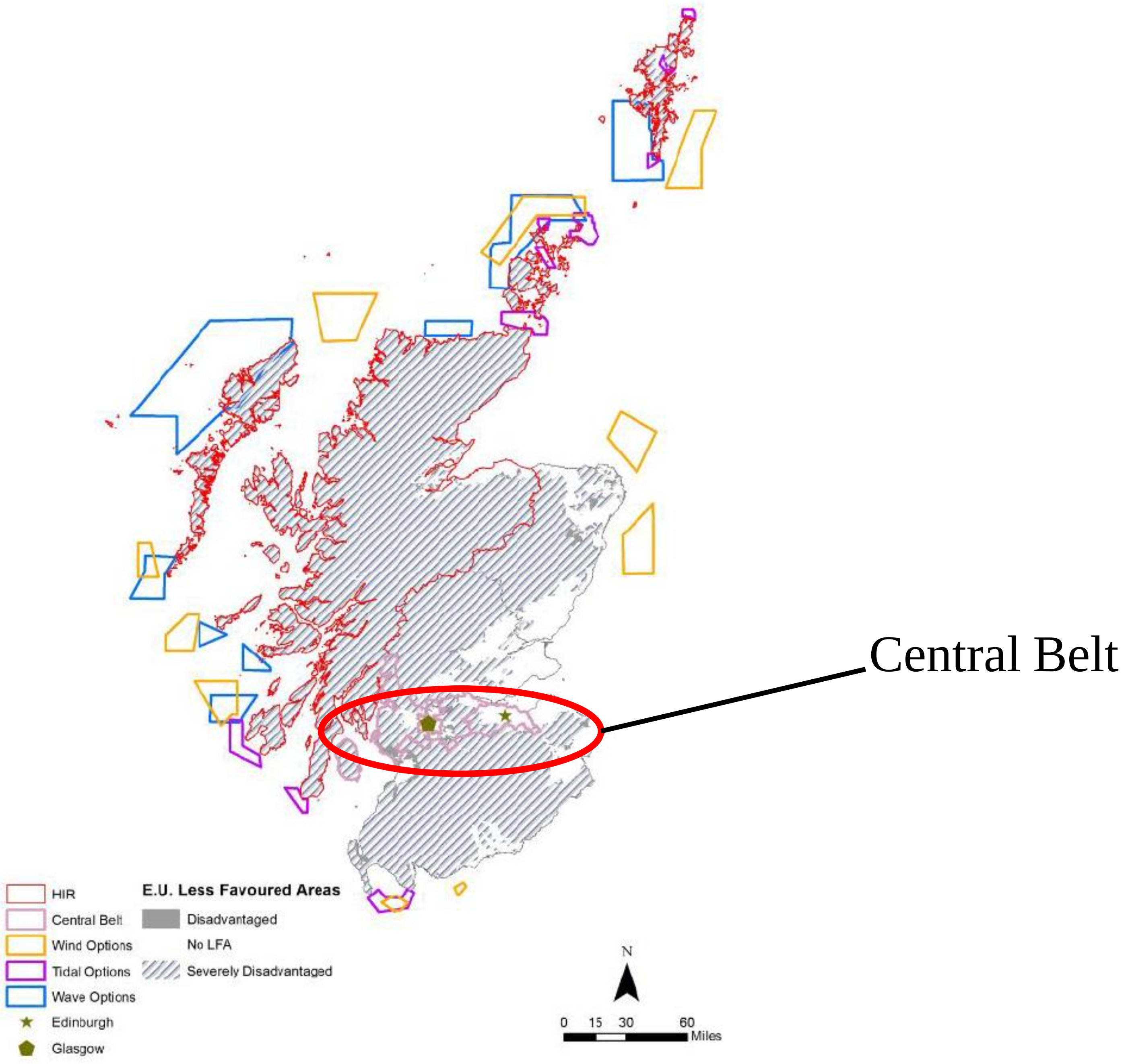
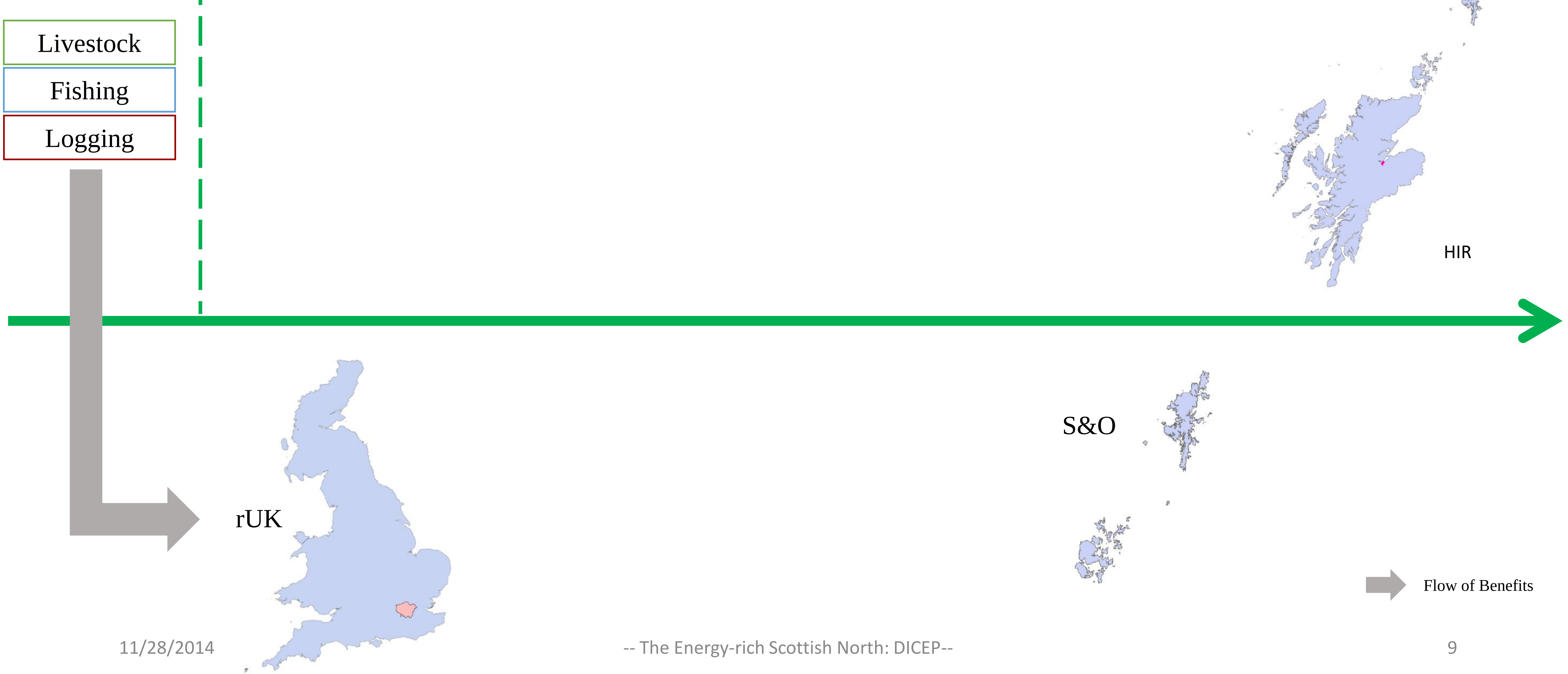


Figure 1 – Map of Scotland with Identified Potential Site for MREs, and Less Favoured Areas[3]

Courtesy of: World Mapper

A Scottish Megalopolis

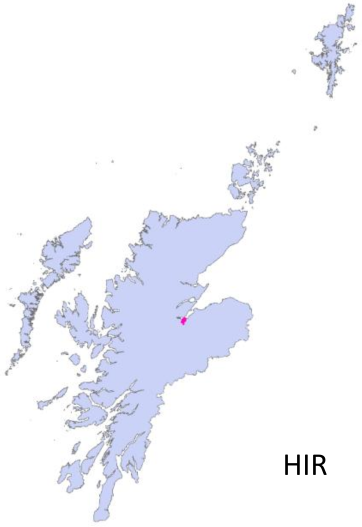
1740-1889 ca.



A Scottish Megalopolis

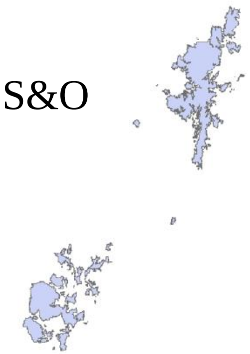
1740-1889 ca.	**1890-1912**
Livestock	Livestock
Fishing	Fishing
Logging	Logging
	Hydropower

rUK



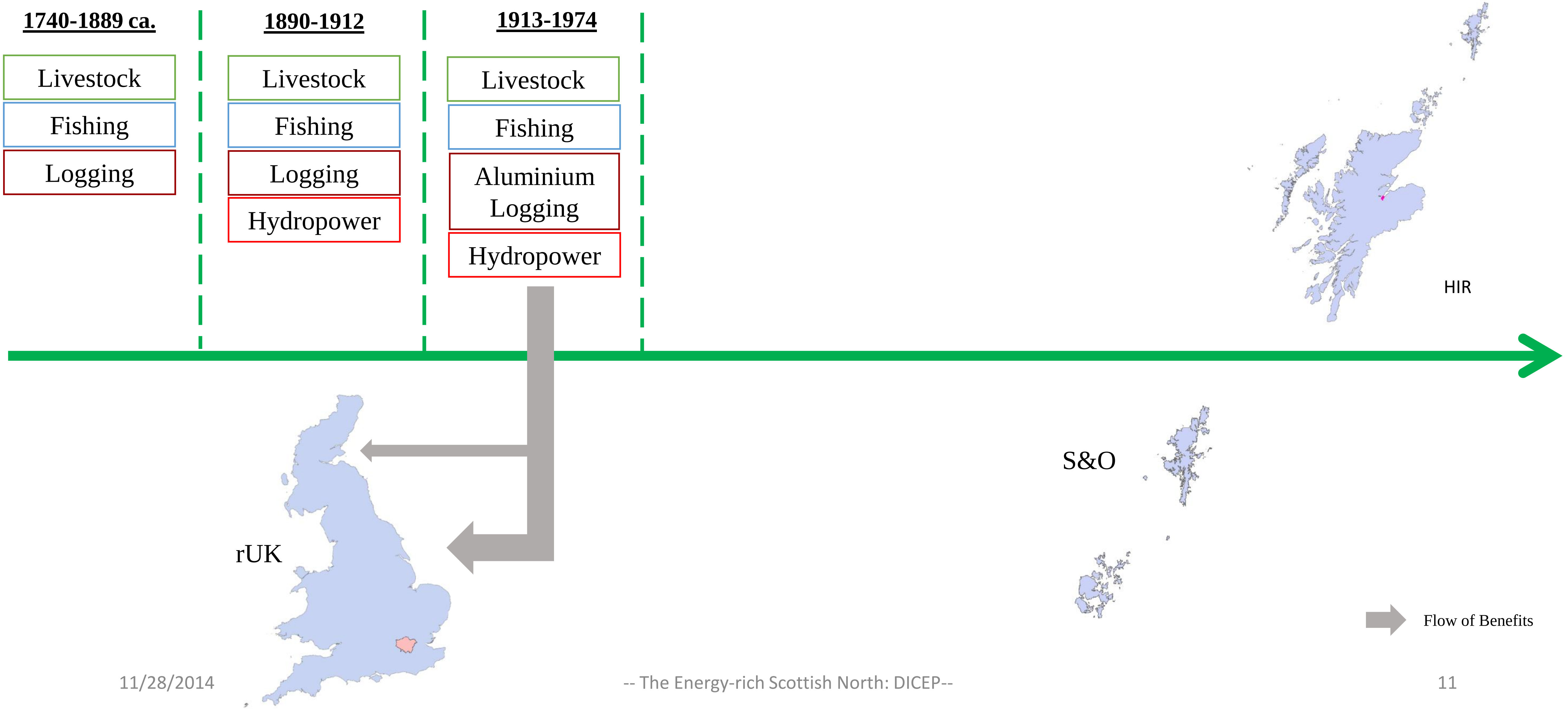
HIR

S&O

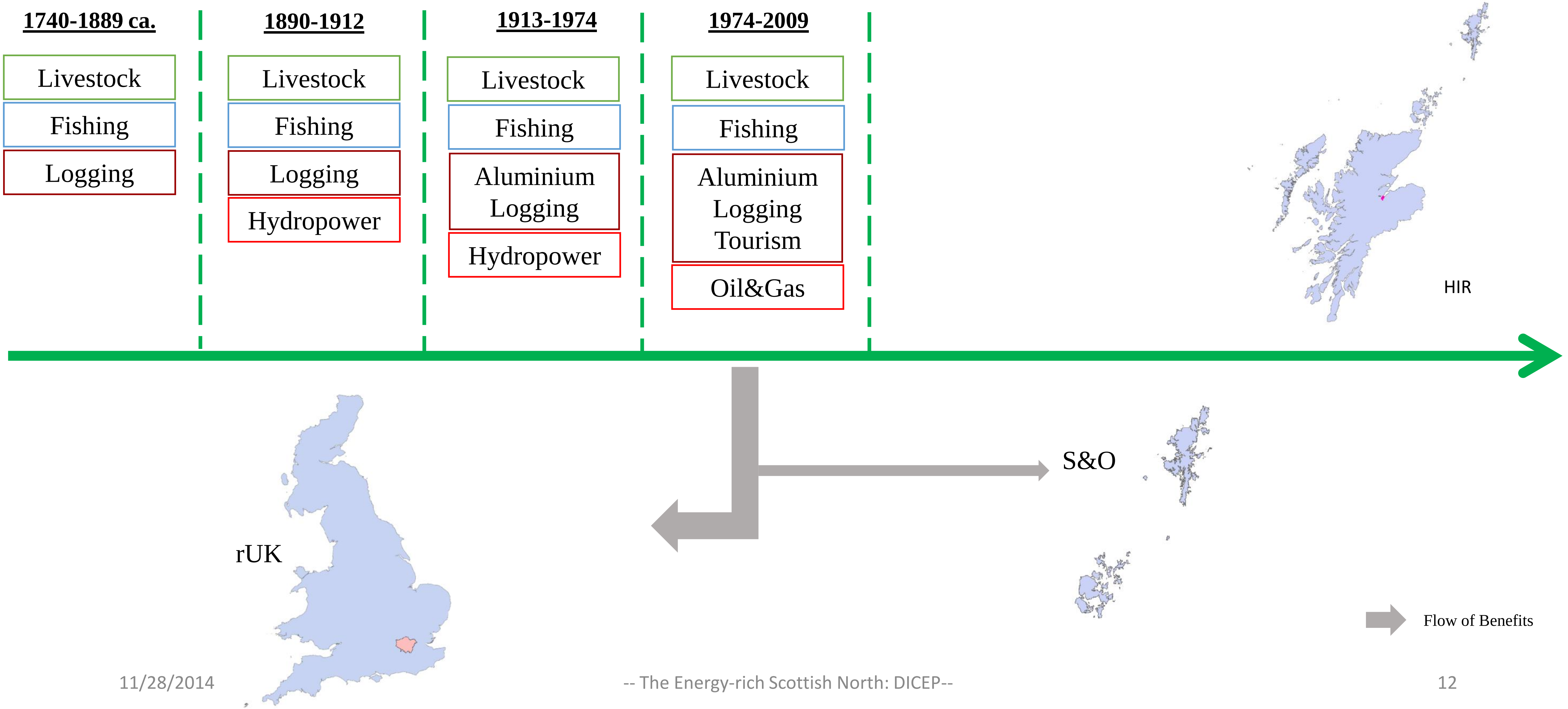


Flow of Benefits

A Scottish Megalopolis



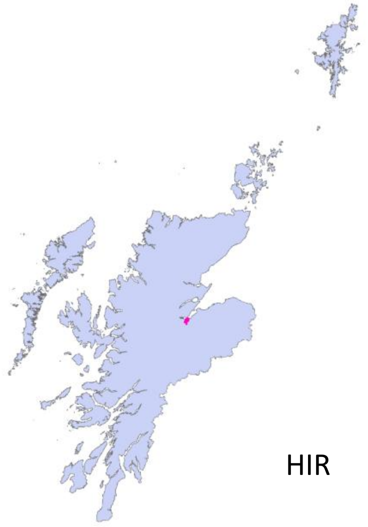
A Scottish Megalopolis

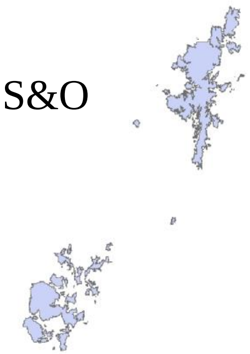


A Scottish Megalopolis

1740-1889 ca.	1890-1912	1913-1974	1974-2009	2009-?
Livestock	Livestock	Livestock	Livestock	Livestock
Fishing	Fishing	Fishing	Fishing	Fishing Aquaculture
Logging	Logging	Aluminium Logging	Aluminium Logging Tourism	Logging Tourism
	Hydropower	Hydropower	Oil&Gas	Oil&Gas MREs

?





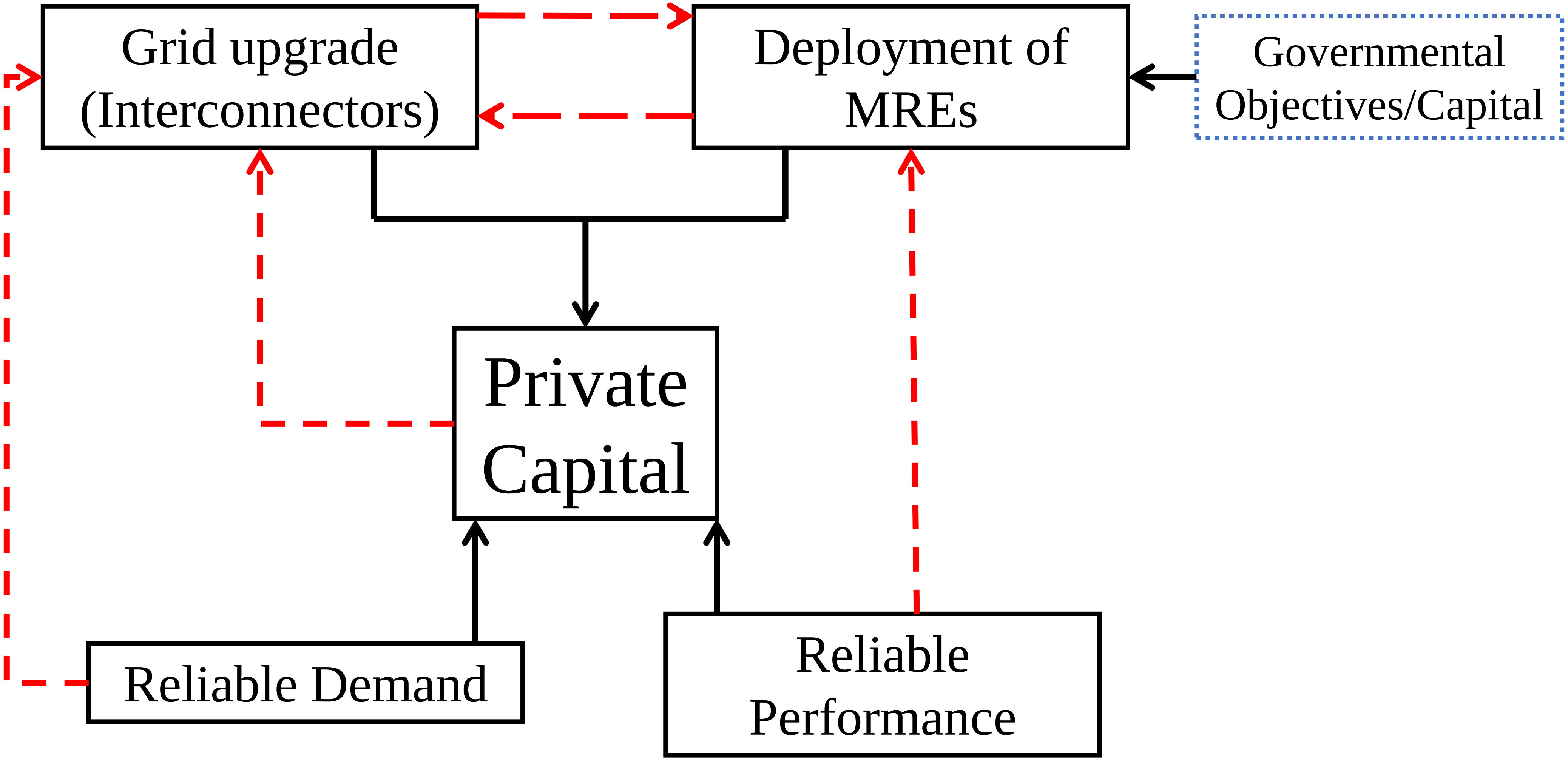
Flow of Benefits

Starting Points

Governmental Objectives

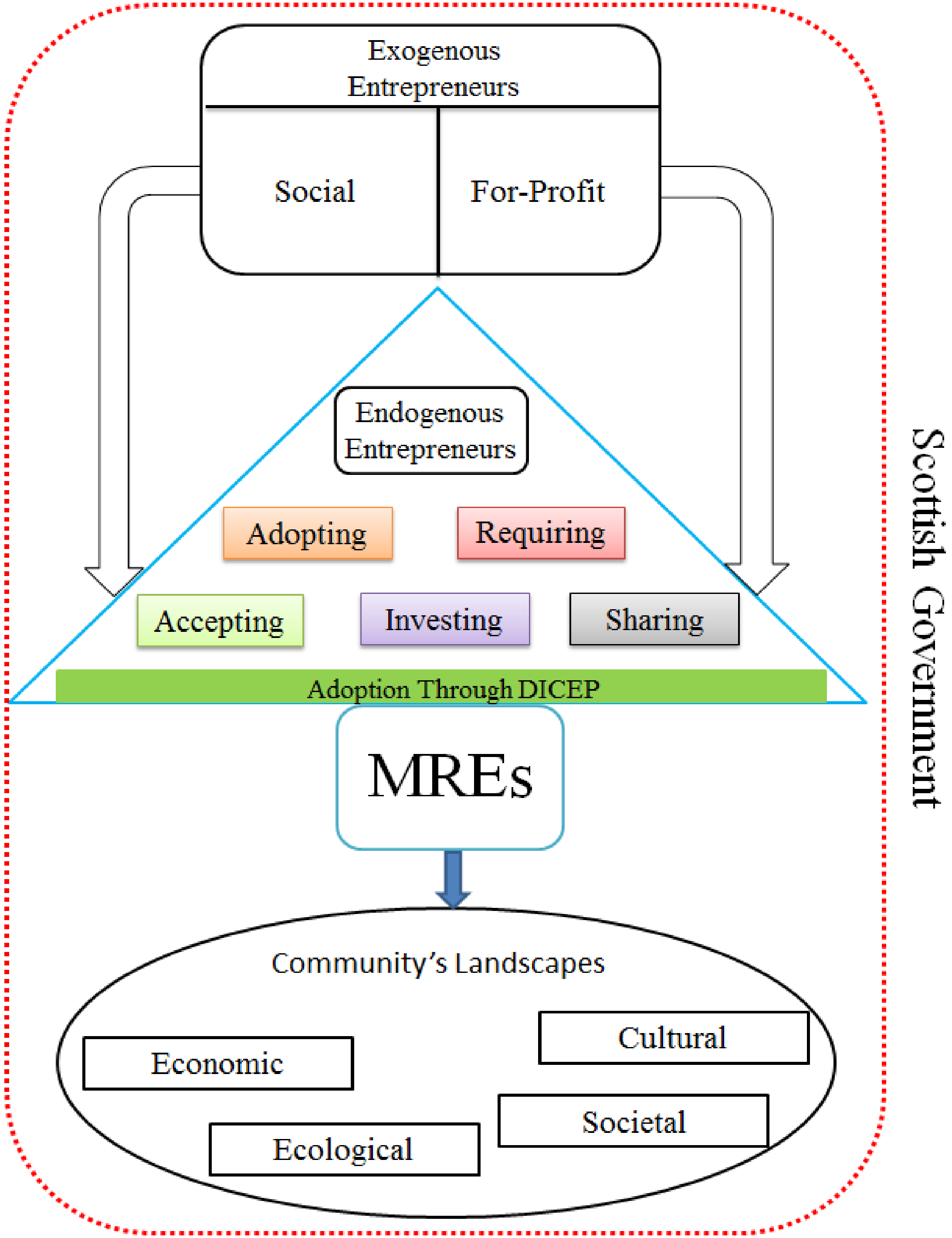
- Grid need upgrades to handle MREs (Johnson et al., 2012; 2013);
- Capital Investment extra-MREs are private (Chronopoulos et al., 2014);
- Direct public capital limited to MREs deployment;
- Grid not completed before 2020-2025 (Krohn et al, 2013; Ofgem, 2014);
- Only S&O are institutionally prepared for grid access (Johnson et al., 2012)

The Conundrum(s)



Beyond Megalopolis

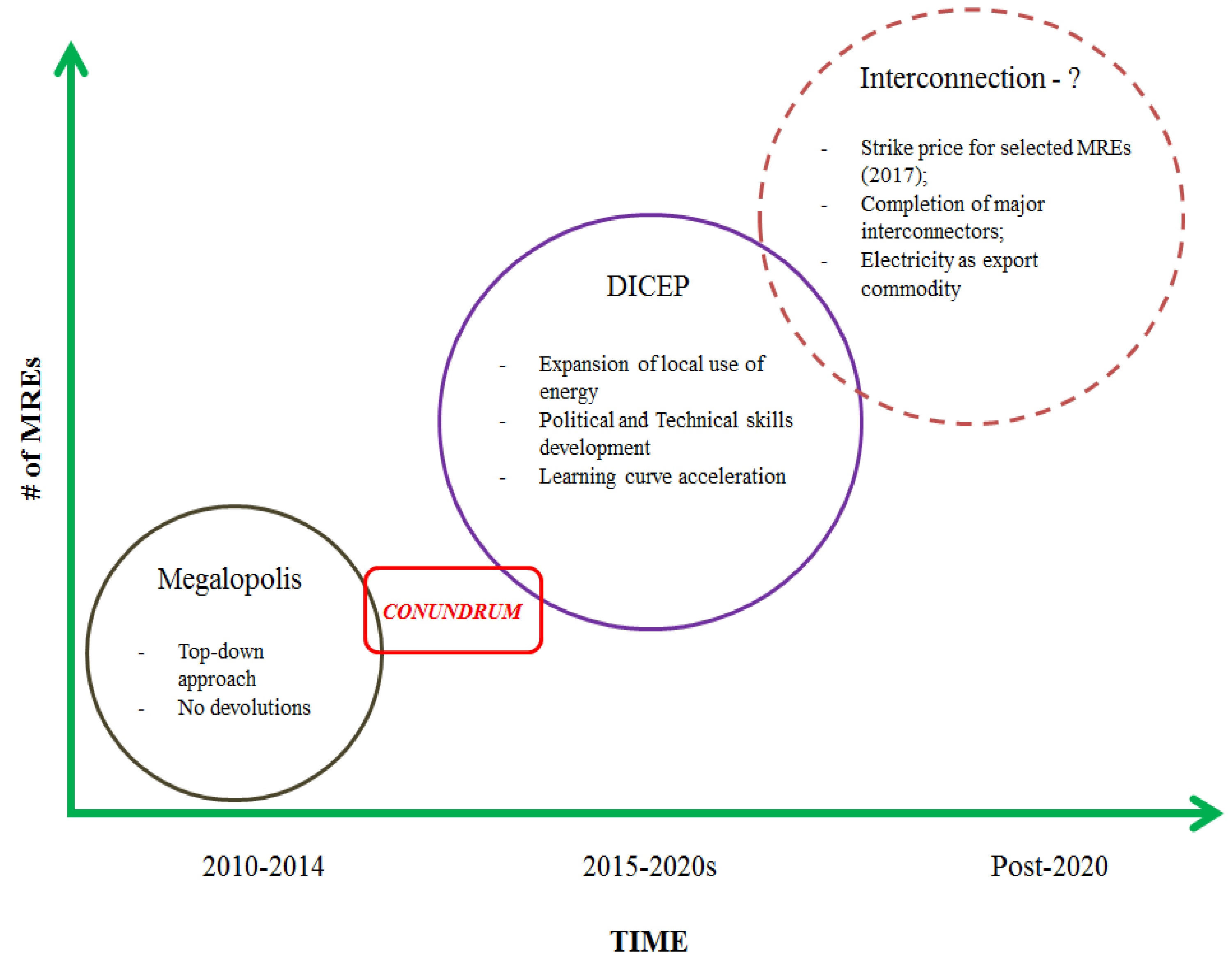
Characteristics	Object	Contextual Reference
Diffused	Distribution of benefits Distribution of MREs Distribution of experience	
Inclusive	Institutional framework	Acemoglu and Robinson, 2013
Community	Local engagement	Johnson et al, 2013
Entrepreneurship	Proactive communities - MREs for reducing socioeconomic fragility	Dees, 2001; Fuchs and Hinderer, 2014


Exogenous Entrepreneurs
Social
For-Profit
Endogenous Entrepreneurs
Adopting
Requiring
Accepting
Investing
Sharing
Adoption Through DICEP
MREs
Community's Landscapes
Economic
Cultural
Societal
Ecological
Scottish Government

Salient Points

1. Paradigm shift: expansion of local demand of energy.
2. Co-financing of MREs deployment AND use of energy: energy packages.
3. Combined economic AND institutional growth (similar to S&O).
4. 3-tier planning: devolved, local and regional.
5. Experience sharing through (in)formal program.

A Rubbing Band



Current Tools: Scotland

1. ***Marine Spatial Planning*****.** Critically for DICEP, it also provides a platform for community engagement and through regional Marine Planning Partnerships. Currently aat the core of Marine Scotland Approach.

2. ***Informal forum for communities*** to share experiences and socio-institutional learning, similar to Community Energy Scotland (CES).

3. ***Community-Owned Projects*****.** Vastly used in Scotland, are more successful than third-party owned projects (Haggett et al. 2013).

4. ***Orkney and Zetland County Councils Act of 1974*****:** Offers a juridical framework to retain (partial) financial benefits to local counties (Johnson et al., 2013).

Current Examples: r-World

1. ***Marine Spatial Planning***. Special zones as in Portugal and coordination with other sectors (Young, 2015).

2. ***Informal forum for communities*****.** Building MREs community organizations to generate trust in the development process similar to solar (Noll et al. 2014; Vinkhuyzen et al., 2014).

3. ***Community-Owned Projects*****.** Vastly used in Scotland, are more successful than third-party owned projects (Haggett et al. 2013).

4. ***From Electricity to Energy*****.** Iceland: Greenhouse program; Server hosting; Advanced biotech; Fish farming (Islandsbanki, 2010; Orkustofnun, 2014).

Yell & Lewis: a ‘tale of 2 towns’

- ***150 MW of on-shore, coastal wind power.***
- ***On protected peat field area.***
- ***Grid is available.***

- ***30 kW tidal.***
- ***Use to power ice factory and 30 homes.***
- ***Grid is not available.***

Yell & Lewis: does & don'ts

Lewis wind farm (Megalopolis)	Bluemull Tidal Energy (Aspects of DICEP)
Privately owned	Community owned (D and C)
Large-scale - No Grid	Small scale (D)
Local use of energy not for industrial use	Combined industrial-residential use (I)
Rejected in the planning process	Planning permitted by community (C&I)
Unknown local social and economic benefits (LWP,2004)	Known local, social, and economic benefits (E)

F

A

Much Solar in the Ocean

❖ ***Solarize:***

1. ***Developer selected through competitive process articulating key values for interested community***
2. ***Network of grass-roots supporters;***
3. ***Campaign run for limited time***

MIXED TOP-BOTTOM-TOP

❖ ***DICEP:***

1. ***Developer selected through MATCHING process with communities;***
2. ***Network of grass-roots supporters;***
3. ***Limited time for acceptance/refusal***

MIXED TOP-BOTTOM-TOP

Courtesy of: Wikimedia Foundation

Next Steps

1. **Identification of selected economic opportunities.**
2. **Understanding local issues.**
3. **Community-owned best practices**

Scenario Building

4. **CGE model: use of AMOS.**
5. **Use of Western Islands and S&O models (Van Leeuwen et al., 2014).**

Scenario Analysis

Q&A

Thank you

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