Exploring the challenges in developing a multi-criteria assessment for smart local energy systems

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Session: Multiple Benefits

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Formerly

This Research Context

- There has been **increased attention** to the **development and deployment of SLES** due to the *influence of the energy transition on local energy planning strategies* with an emphasis on *decarbonisation, renewable generation and smarter, more efficient energy systems*.

- **The development and deployment of SLES** are enabled by *energy system strategies* that include *retrofitting, re-designing and improving energy systems through more digitalisation and decentralisation.*

- *This facilitates a transition in energy production, supply and distribution, and energy resource utilisation and consumption* [1-3]
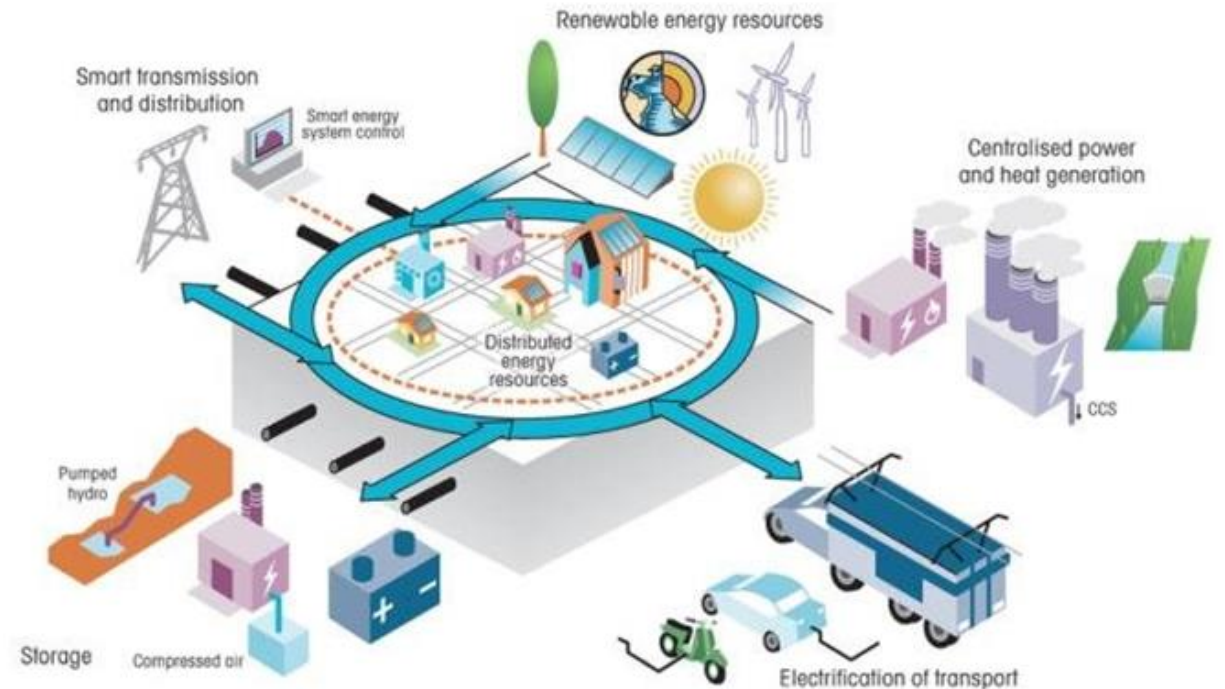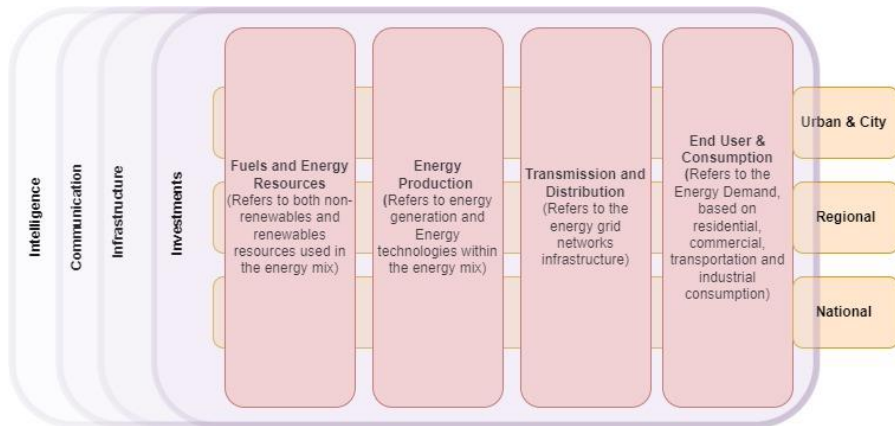

Energy System Characteristics and Management [4]
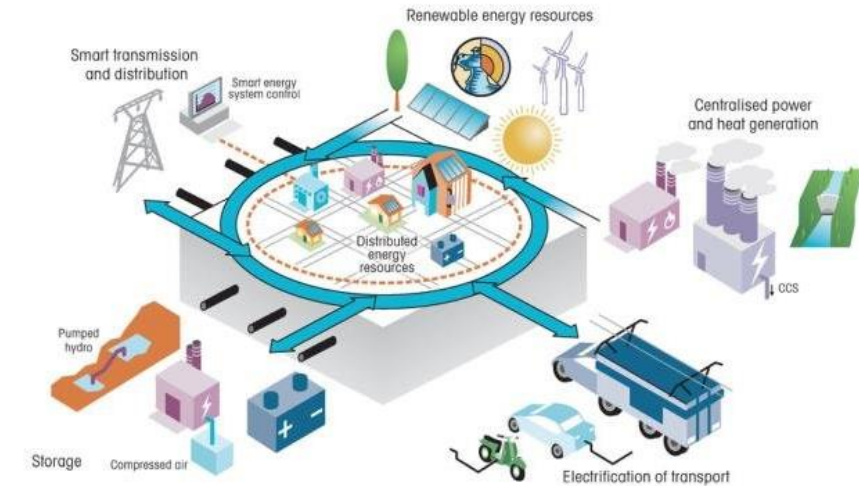
This Research Context

Assessment Criteria & Assessment Tool

Energy System Stakeholders Map [5]
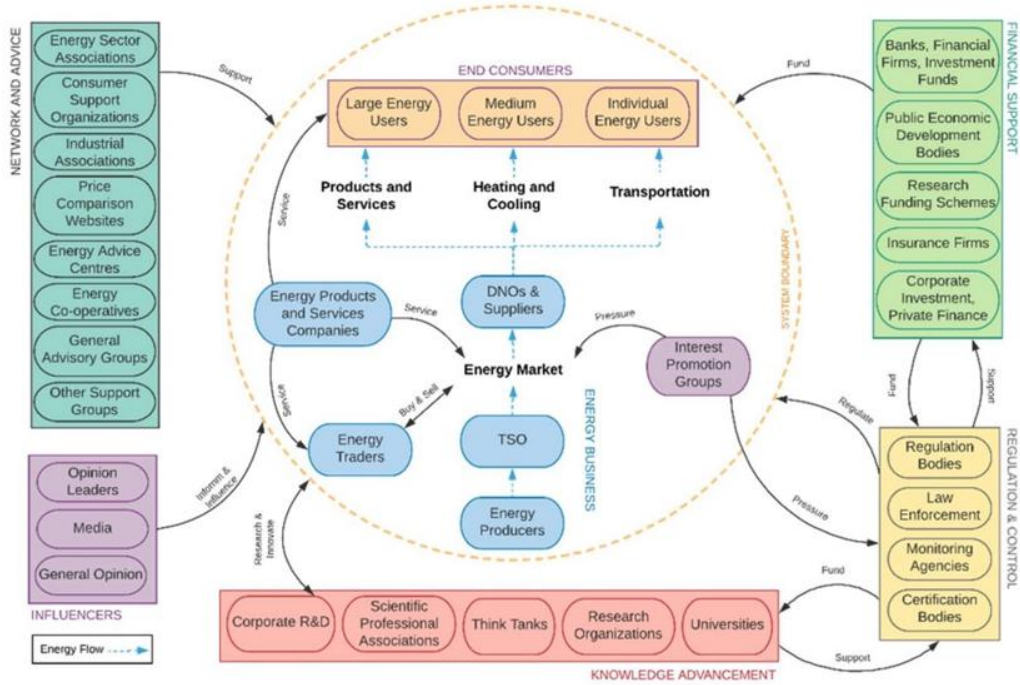
Energy System Characteristics [6]
[Layers, Roles, Level]]

Energy System Characteristics and Management [4]

3

Research Process

**Identification of Themes
and Criteria**

**Semi-Structure Interview
with Experts**

Outcomes - Challenges

Key Themes
Business & Economics
Data Management
Technical Performance
People and Living
Environment
Governance

Phase 1 –
Literature Review& Stakeholder Engagement

Phase 2 –
Stakeholder Engagement
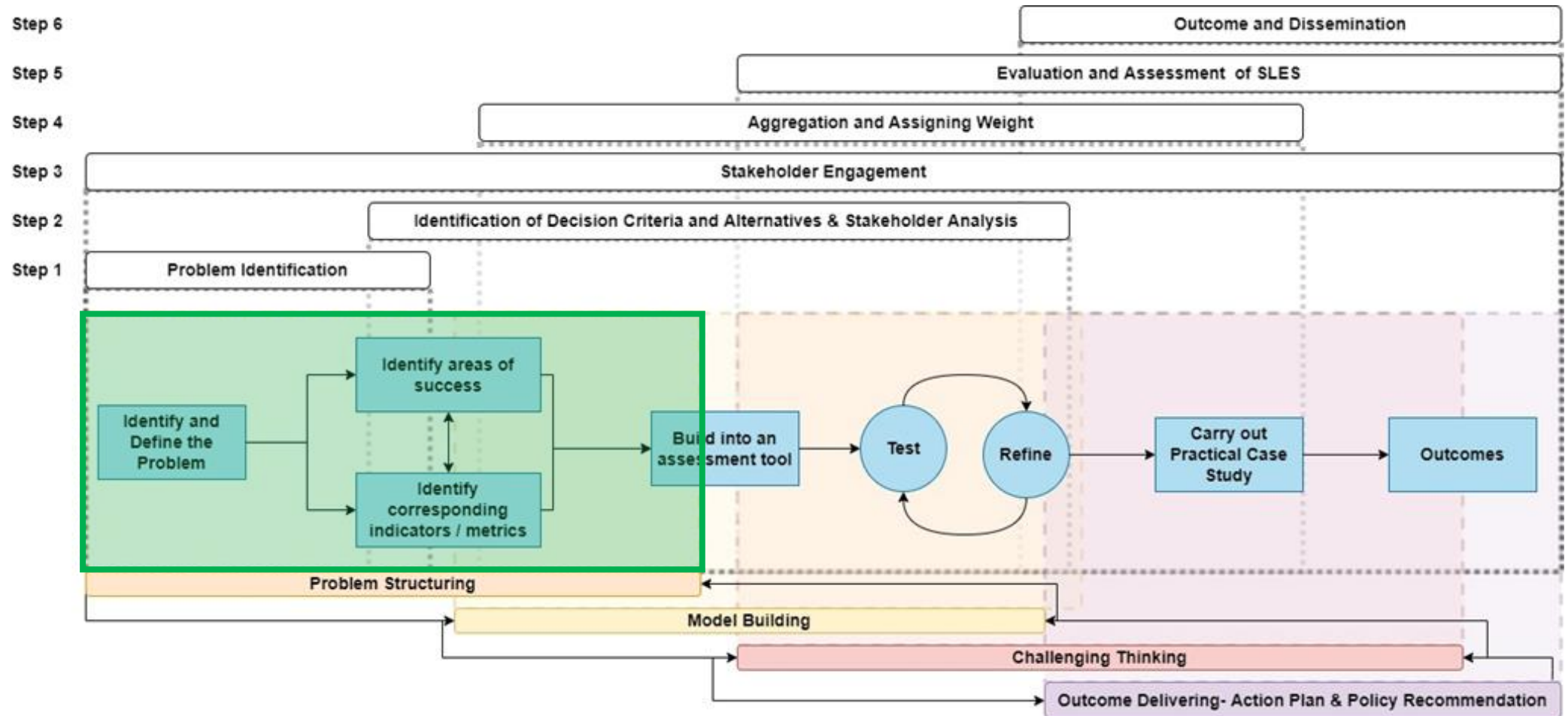
Phase 3 –
Analysis

Where does this research fit in MCA-SLES Development Phase


MCA Development Process Chart, highlighting the sex steps and four MCA development phases [7]

Key Results

- One of the primary challenges identified by the experts interviewed was **saturation or stakeholder burnout** in terms of stakeholder engagement.

- **Data collection challenges** were also identified for many criteria such as fuel poverty, access to capital, debt-equity ratio, grid management, ecosystem and human health impacts,

- Specific challenges raised by the **breadth of the SLES definition**, which will introduce challenges for assessing core assessment themes, sub-themes and metrics across different projects.

- The experts also highlighted that having **a clear definition** of the core assessment themes, sub-themes and metrics is important and **reduces miscommunication** and ensures that the right data is collected and that it is representative (particularly with regards to the project stakeholders and end-users) to ensure quality and realistic outputs.
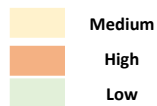
Challenge 1 - Stakeholder Burnout
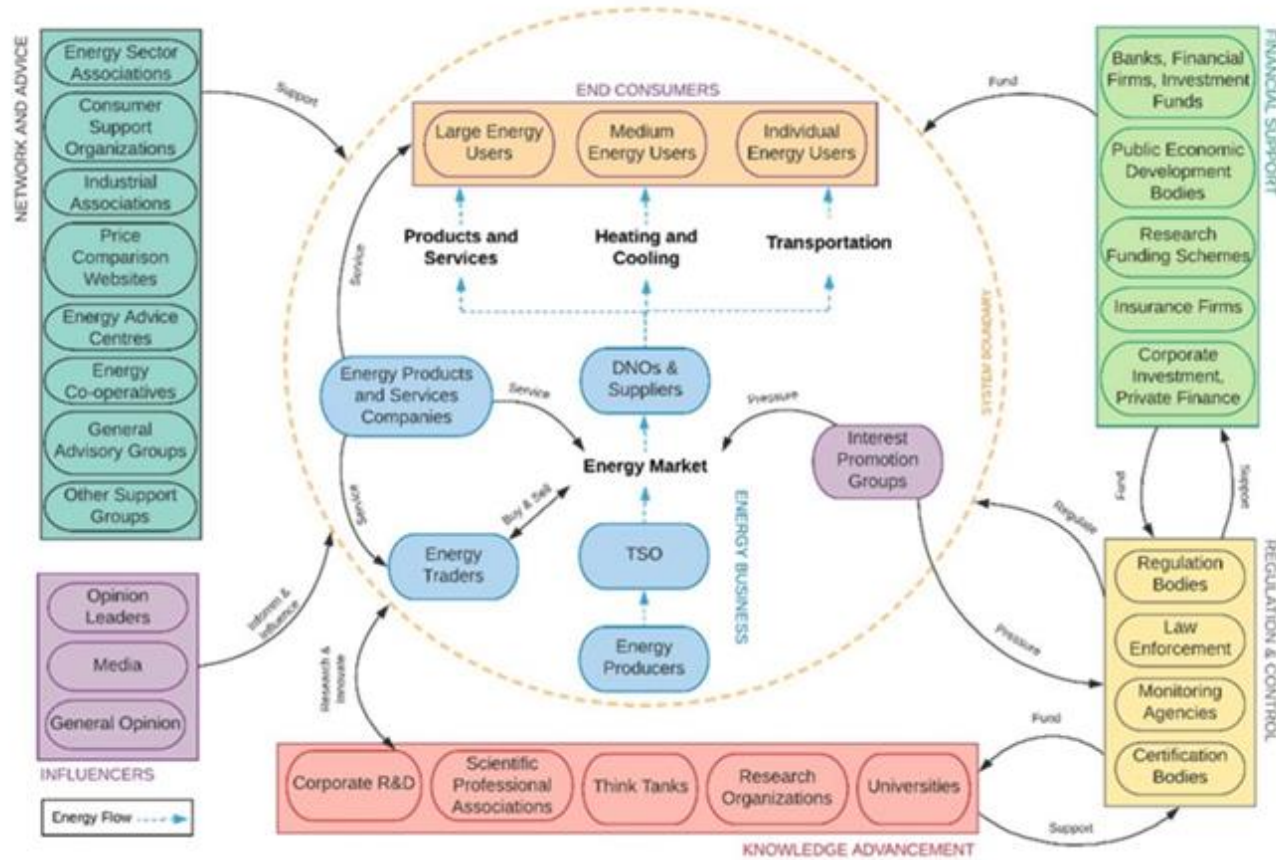
Energy System Stakeholders Map [5]

Stakeholder Engagement

Challenge 2 - Data Collection Issues

Key Themes	The Degree of Challenge
Business & Economics	
Data Management	
Technical Performance	
People and Living	
Environment	
Governance	

Medium
High
Low

Key Themes & Identified Degree of Challenge

The experts also ***highlighted challenges in accessing data for specific metrics***; for example, data on *access to capital* or the *debt-equity ratio* may be difficult to access, as it is commercially sensitive for the relevant investment funds.

There was agreement among the experts that understanding and evaluating the environmental aspects are important; however, they ***identified that data availability and collection would be the principal challenges in assessing all the criteria related to the environment theme***.

The three experts considered that ***reliability was not an easy criterion to measure***, particularly the suggested metrics of availability and quality.

Challenge 3 - Broad Definition and/or Limited Scope of Assessment Criteria

Key Themes	The Degree of Challenge
Business & Economics	
Data Management	
Technical Performance	
People and Living	
Environment	
Governance	

Medium
High
Low

Key Themes & Identified Degree of Challenge

Expert No. 6 also highlighted that ***this theme was missing a criteria or metric*** that focuses on the consumer or customer and assesses issues concerning retailing, finance, data legislation and consumer protection.

One key recommendation for ***this theme*** was that measurement of energy services ***needs to be further divided*** into energy storage, generation and demand (such as demand-side management

One challenge identified here was that the SLES experts tended to ***exclude certain criteria*** as being challenging for the SLES to implement, such as scalability or maturity

Next Step in MCA-SLES Development

- The next steps in developing an MCA-SLES tool will focus on
  - A. **Refined** core assessment themes, corresponding sub-themes and associated criteria/metrics.
  - B. **Develop a practical application** of the tool to utilise *to carry out case study assessments*.
  - C. **Carry out case studies**, where SLES projects are provided with the opportunity to assess and monitor the SLES implementation and deployment process in relation *to the set forward by core assessment themes*.

Achieving Objective	
Difference (%)	
-0.412	-41%
-0.195	-20%
-0.382	-38%
-0.378	-38%
-0.264	-26%
-0.176	-18%

% towards Achieving an Objective

Theme 1

— Objective — Current
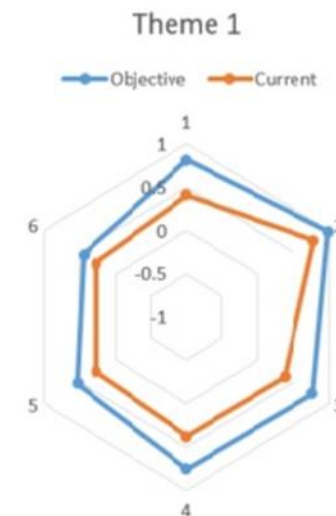
Benchmark with Assessment Criteria

Thank you for your attention! Have a great day ☺

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Acknowledgements:

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