Developing the framework for multi-criteria assessment of smart local energy systems

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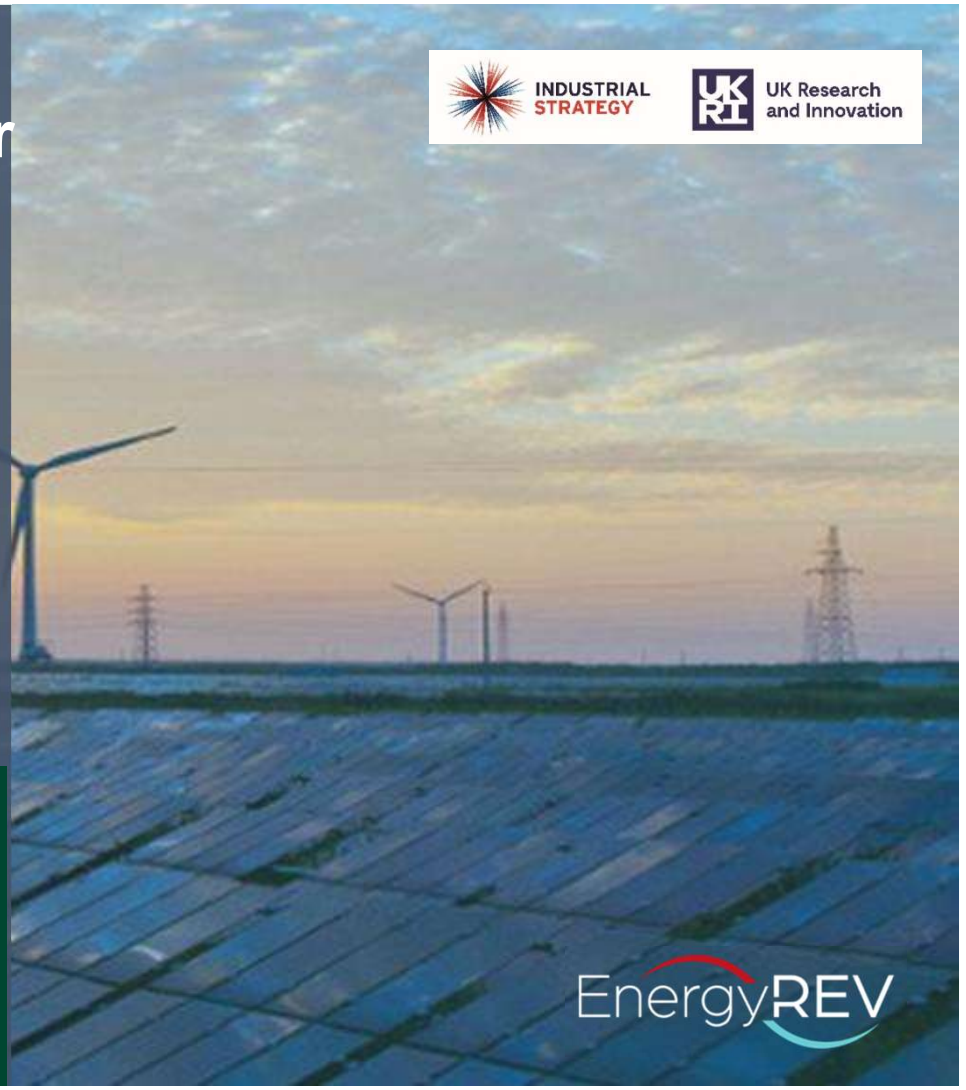
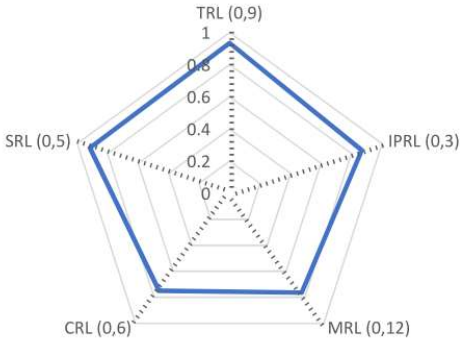
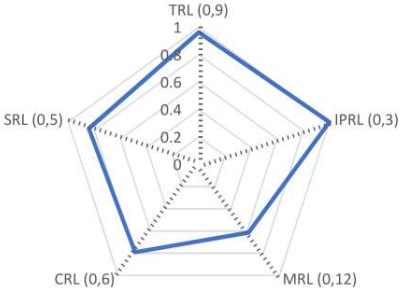


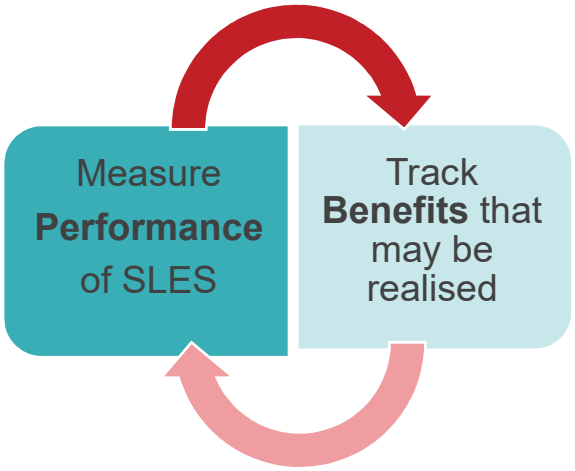
MCA Tool - Relevance

- An ***independent standardised assessment*** tool will help developers and SLES implementers ***benchmark*** progress against their own aspirations.
- Provide evidence to ***build investors' confidence***
- ***Route map*** and ***checklist*** for ***planning*** to support developers and implementers ***for SLES replication***
- Policy makers will be able to ***identify areas where policy change is needed*** to enable progress.





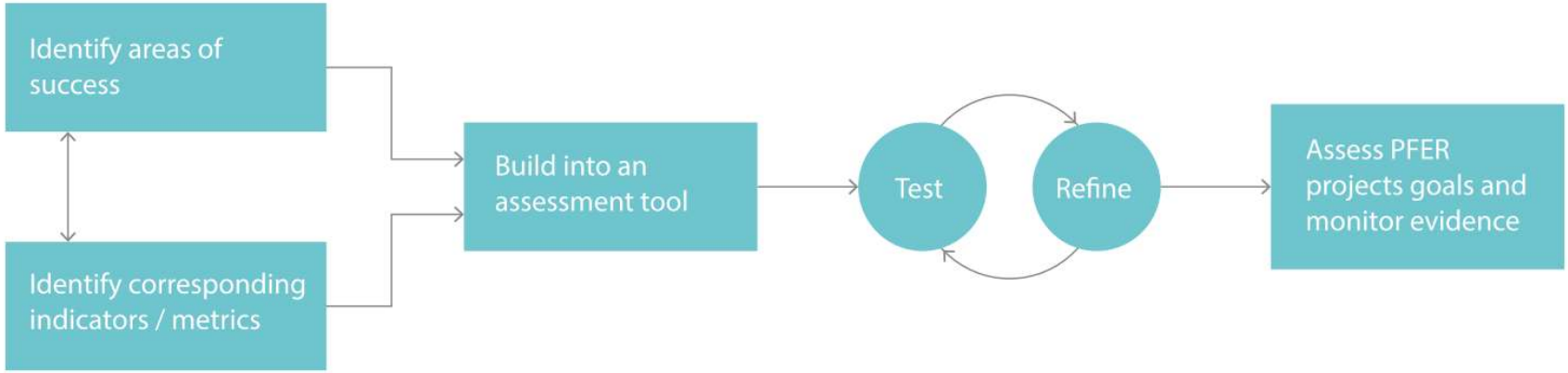
MCA Project Overview



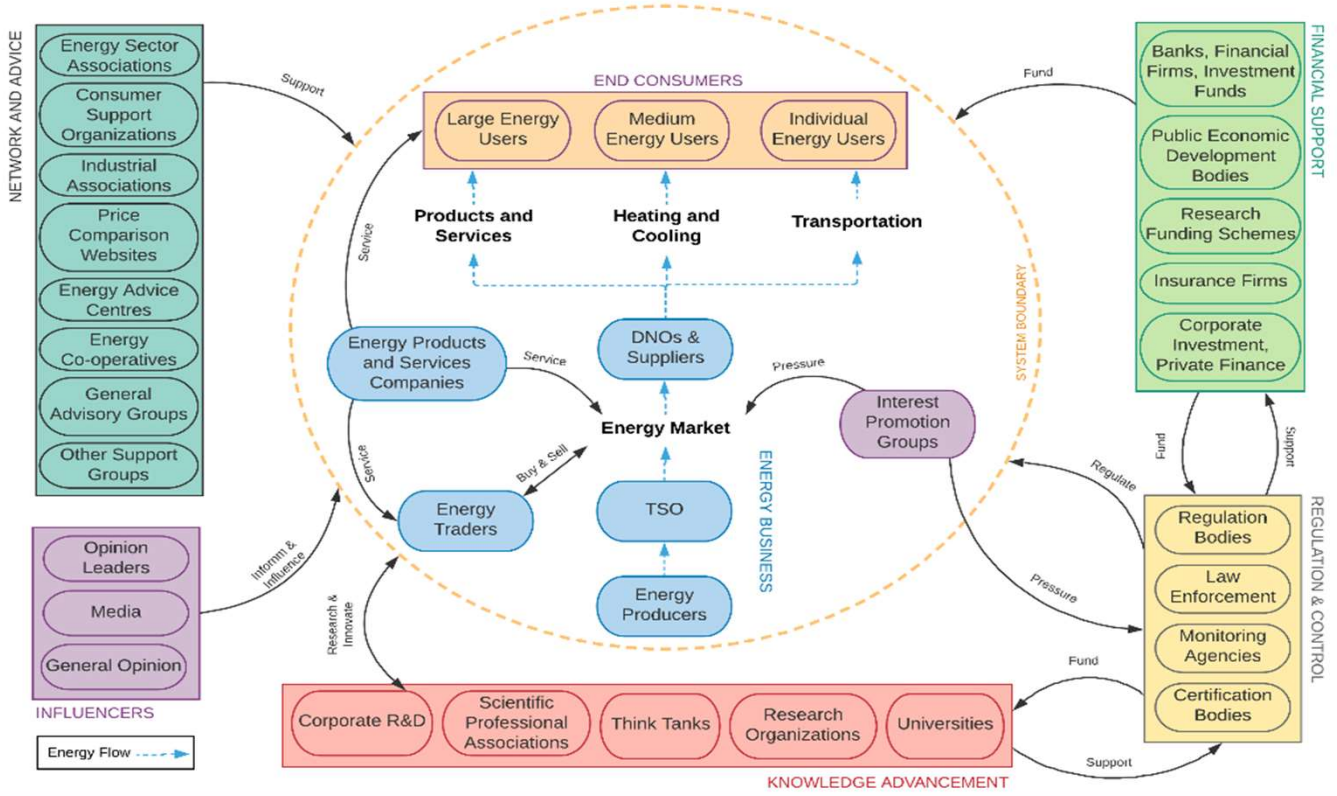
Develop a simplified, technology agnostic and multi-criteria assessment (MCA) framework to:

- Examine Smart Local Energy Systems (SLES) projects using a broad set of criteria
- Track **two** strands:
  - System performance
  - Benefits realisation

Iterative process



Stakeholder Mapping

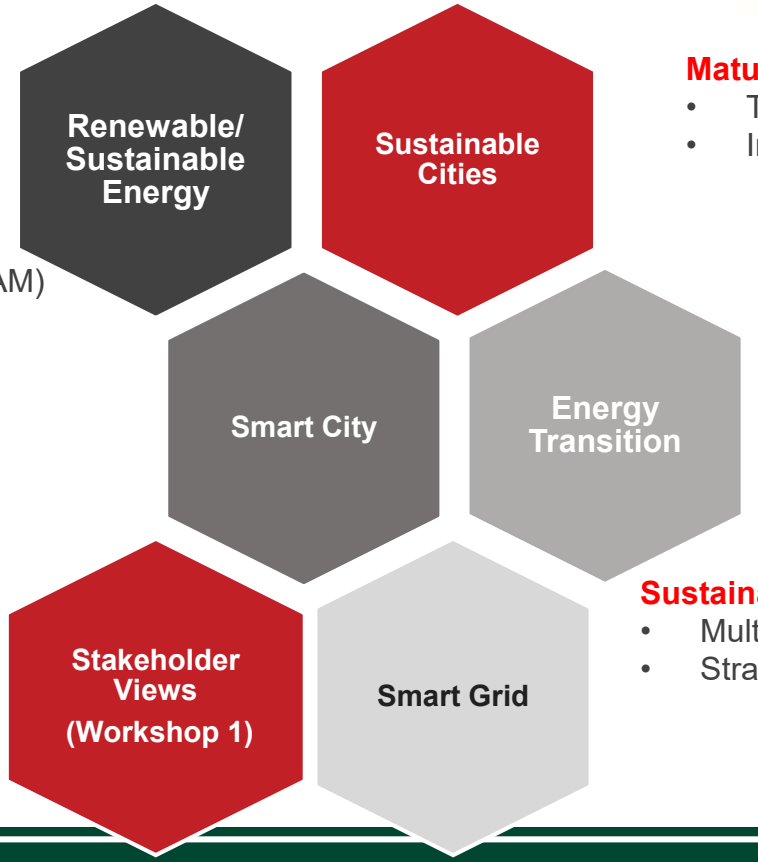


Developed from
(Dallamaggiore et al., 2016)

Review of existing evaluation tools

Planning and forecasting, e.g:
- Techno-economic assessments
- Integrated Assessment Modelling (IAM)

Other, e.g:
- Sustainable Accounting
- Smart Energy Technology Landscape



Maturity or readiness level, e.g:
- Technology readiness level (TRL)
- Innovation readiness

Sustainability transition, e.g:
- Multi-level perspective (MLP)
- Strategic Niche Management (SNM)

Key Themes

Data Security - *Identification of sensitive data and the processes for protecting it*

Data Connectivity - *Provision of ICT and data infrastructure, including issues such as ICT accessibility and penetration*

Technical Performance - *Technical performance, including criteria such as flexibility, resilience, efficiency, innovation and renewable capacity.*

Mobility - *The interactions of transportation and SLES, such as transport management and electric vehicle technology*

Economics - *Economic performance, such as benefit-to-cost ratio and rate of return.*

Key Themes

Business and finance- *Wider market-related issues, such as financing and job creation*

Governance (Socio-Political)- *The political and regulatory alignment of a project, as well as socio-economic impact*

People -*The impact on end users, with regards to aspects such as education/ICT skills, engagement and acceptance*.

Living - *The benefits on communities and their social interactions, such as housing conditions, equity and culture or behaviour.*

Environment - *The environmental performance, such as the impacts on climate change, human health, resource availability and use of waste energy*.

Taxonomy to measure SLES Performance

Data Security
- Security
- Privacy
- Trust

Data Connectivity
- Digital Technology Enablers
- ICT Infrastructure
- ICT Management
- ICT Accessibility

Technical Issues
- Renewable Fraction
- Energy Services Provided
- Reliability, Resilience
- Flexibility, Scalability
- Efficiency, Maturity
- Grid accessibility
- Innovation Adoption

Mobility
- Transportation Management
- EV Infrastructure

Economics
- Techno-Economic
- Market Regulation

Business and Finance
- Business Case
- Affordable or competitive cost
- Investable
- Employment

Governance/ Socio-political
- Transparency and Strategic Direction
- Socio-Economic Impact
- Integrated Management
- Political and Regulatory Alignment

People
- Education & Gender Equality
- ICT Skills
- Engaging/ Participation
- Acceptance
- User Friendliness/ Control
- Inclusion/ Empowerment
- Consumer Protection

Living
- Housing
- Equity
- Culture or Behaviour
- Livelihood
- Convenience

Environment
- Climate Change (Decarbonisation)
- Ecosystem (land, fresh water, marine)
- Human Health
- Resource Availability
- Other e.g. Waste Energy Potential

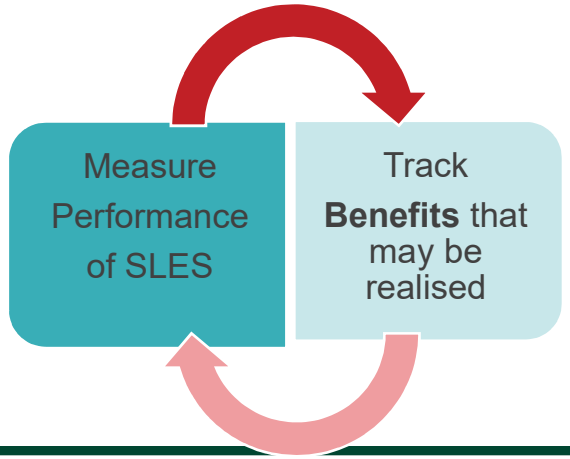
SLES Benefits aligned with UN SDGs

www.sustainabledevelopment.un.org

Progressing towards UN SDGs

Sustainable Development Goals	SLES Taxonomy Themes		
4 QUALITY EDUCATION	Economic-Market	People	
5 GENDER EQUALITY, 10 REDUCED INEQUALITIES	People		
7 AFFORDABLE AND CLEAN ENERGY	Technical		
8 DECENT WORK AND ECONOMIC GROWTH	Economic-Market		
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	Technical	Environment	Transport
11 SUSTAINABLE CITIES AND COMMUNITIES	Transport	Living	
12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 14 LIFE BELOW WATER, 15 LIFE ON LAND	Environment		
13 CLIMATE ACTION	People	Living	Environment

Next Steps



1. How do different stakeholders rank the relevance of each theme?
2. How might the data be gathered to report on these measures?
3. Is the MCA Tool functional for community/local energy systems?

Any questions
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