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.
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

1. Identify areas of success
2. Identify corresponding indicators / metrics
3. Build into an assessment tool
4. Test
5. Refine
6. Assess PFER projects goals and monitor evidence
Stakeholder Mapping

Developed from (Dallamaggiore et al., 2016)
Review of existing evaluation tools

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

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

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

**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

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<tr>
<th>Sustainable Development Goals</th>
<th>SLES Taxonomy Themes</th>
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<td>5 ☑️ Gender Equality</td>
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<td>7 ☑️ Sustainable Cities</td>
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<td>11 ☑️ Sustainable Transport</td>
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<td>13 ☑️ Biodiversity Conservation</td>
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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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