



Urban Pathways

Li-ion batteries as energy storage for solar energy and electric mobility in Marrakech, Morocco

Participants and roles

1. Blekinge Institute of Technology: coordination, expertise in urban planning
2. University Cadi Ayyad (IMED Lab.): expertise in renewable energies, electrochemical Energy Storage - Lithium batterie (LiBs), electric mobility, thermal energy storage, eco-building
3. Green Energy Park: provision of the Green & Smart Building Park platform and staff
4. National School of Architecture Marrakech: expertise in building materials and techniques

Context, motivation and objectives

The demonstration uses lithium-ion batteries to foster renewable energies and electric mobility, taking a circular economic perspective at the core of the approach.

Challenge

1. Improve rural living conditions (housing needs, use of renewables) in order to tackle rural exodus stemming from the lack of basic services and limited work opportunities.
2. Growing demand for lithium-ion batteries and need for a proper end-of-life management.
3. Increase of fossil-fuel motorcycles and mopeds, dependent on fuel imports

Innovative approach and contribution to the project

1. Renewables and energy storage systems: implementation of an off-grid network in the Green Energy Park (cost- and energy-efficient PV panels, convenient Lithium-ion batteries) and a model of housing unit using new construction techniques, at low costs.
2. Batteries end-of-life management: Diagnostic, Reuse and Recycle second life lithium-ion batteries via teaching, implementation of diagnostic and test facilities, protocol to collect LiBs, R&DI to recover LiBs high-value components (e.g., cobalt, graphite, nickel)
3. Electric mobility: Equipment by electrical engines of motorcycles in cooperation with the 'Female Club of Motorcycles' in Marrakech, to reduce CO2 emissions

Expected results

1. One off-grid network (PV panels, LiBs), one housing unit model
2. Training, diagnostic and test facilities, protocols and R&D on LiB end-of-life management
3. 5 electric motorcycles

Sustainability, replicability

1. Green transition integrating energy, housing, mobility needs, in a circular perspective
2. Strong replicability within the country, following testing of reference models
3. Strong replicability outside the Country and opportunities for South-South exchanges, especially other demonstrations actions integrating LiB as energy storage systems (replication in Nigeria is envisaged)

Expected impacts

1. Demonstrating economics of PV green transitions, fostering replicability at broader level
2. Job creation in the fields of PV energy, LiB end-of-life management, electric mobility
3. Gender inclusive electric mobility

Implemented by:



In cooperation with:



Supported by:



based on a decision of the German Bundestag