Hochschule Bochum Bochum University Df Applied Spierce Stechnologies Laboratory

## Sustainable Energy Impact

Bringing power to the people

Sustainable energy and mobility concepts in developing countries using blockchain technology

We are supported by the federal government and integrate private sector in our research



Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection





Federal Ministry for Economic Cooperation and Development



 Deutsche Gesellschaft für Internationale
Zusammenarbeit (GIZ) GmbH BMU: Exportinitiative Umwelttechnologie Creating framework conditions for the sustainable export of environmental technologies

GIZ PAMA: Invest for Jobs Program

Aims to support the industrial added value of

manufacturers and suppliers in the

automotive, transport technology in Africa

#### Project partner from the private sector:



#### MoNal Website:









### The project: Open to all Degree Programs We are looking for YOU!



#### In this project you will be able to do:

- International Development
- Sustainability Analysis
- Technical Development
- IT Development
- Business Development
- PR/Communication & Stakeholder Management
- Design/Creation
- Scientific Research & Publications

### Our Team in WS21/22



Sustainable Energy Impact - bringing power to the people

## Areas of activity

Research & Development Focusing on sub-Saharan Africa

Sustainable Energy Impact – bringing power to the people

### **Saharan Africa**

### Installation of mini-grids and e-vehicle sharing



Installed Solar Panels and Solar Charging Stations at the Don Bosco Campus

#### Pilot project on Don Bosco campus, Ghana:

- Installation of a smart mini-grid using blockchain technology
  - Load management
  - Price algorithm
  - Power independence
- Charging of light electric vehicles by the solar mini-grid
- Quantification of environmental relief and economic potential for end users and transitioning economies



Batteries for storage of solar energy and control of the smart solar mini-grid

### **TF Mobility** Development of Sharing System - Respecting local Conditions



- Assessment of the sharing system from an economic, environmental and social point of view
- Development of evaluation process for the criteria catalogue to asses e-mobility concepts
- Research on perfomance of LEVs in local conditions to make recommendations on the adaption of vehicles







Own figure based on (Goedkoop et al, 2018: 4).

### TF Environmental Impact

Conducting LCA and analyzing possibilities to recycle PV modules



Source: own illustration

- Analysis of the formal and the informal sector and the recycling conditions
- Searching for possibilities to recycle PV modules in Ghana
- Conducting life-cycle analysis on solar components and e-mobility devices



 Determining the value possible from extraction of raw materials from solar e-waste



### **TF Technical Development** Solar Mini-Grid data collection



 Creation of layout and visualization of the mini-grid with the help of computer programs





- Integration of deferrable loads into the system to add flexibility regarding load management
- Analysis of the available data from all components to determine if the results are reasonable for the energy flow

### TF Business Development

Building Sustainable Business Models on E-Mobility



- Provision of a profitability analysis including revenues and costs to calculate investments, break even points etc. for a mobility sharing system
- Investigation of economic feasibility of PV module recycling process
- Definition of price flexibility of electricity (flexible load management)
- Use of blockchain based technologies for transparent pricing









### **TF Communication** Social Media Engagement & Publications



Source:Instagram/sustainable\_energy\_impact



Source: hochschule-bochum.de/Project overview



Source: Article of TF Communication WS21/22

- Communication of the project's work on several offline and online channels
- Creation of continuous content for the social media accounts
- Creation of publication opportunities online and via conferences
- Interfacing with all other task forces







### **TF Berlin Mini Messe**

Organising meetings, workshops and curating content





- Organisation of a workshop on the topic "Sustainable Business Models" in the Motion ab Berlin
- Scheduling visits with project partners like Suncrafter

IOSB

# Be part of it!

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Contact Fred Adjei via email until Monday, 21.03.2021

On 22.03.2022, at 12:00 p.m., our virtual kick-off will take place

You will receive the link to the web meeting after your registration