

# Innovation for Electrification

Powering Industries & Productive Uses of  
Energy with DRE

29 February 2023

Organised by



# Opening Remarks



**Mr. David Lecoque**  
CEO  
ARE

# Agenda

<b>Opening remarks</b> 4 minutes	<b>Mr. David Lecoque</b> CEO, ARE
<b>Facilitator</b>	<b>Mr. Deepak Mohapatra</b> Senior Officer – Business & Market Development, ARE
<b>Industry Announcement</b> 8 minutes	<b>Ms. Nadja Katnani</b> Project Manager, Messe Augsburg
<b>Multi-technology white paper presentation</b> 8 minutes	<b>Ms. Diane Domkam</b> Public Affairs Manager, ENGIE Energy Access
<b>Pitch 1</b> 8 minutes	<b>Mr. Christopher Pye</b> Global Segment Manager for Hybrid Microgrids, ComAp
<b>Pitch 2</b> 8 minutes	<b>Mr. Marco Honsberg</b> CTO, EMPO-NI
<b>Pitch 3</b> 8 minutes	<b>Mr. Swaleh Hassan</b> Strategic Business Development Manager, GadgetroniX
<b>Pitch 4</b> 8 minutes	<b>Mr. Marcelino Silveira</b> Managing Director, Lighthouse Africa Investments
<b>Pitch 5</b> 8 minutes	<b>Mr. Alban Brice Mongbo</b> Founder, BM Solutions
<b>Pitch 6</b> 8 minutes	<b>Ms. Laura Corcoran, COO</b> <b>Mr. Ghirmay Abraham, Executive Chairperson</b> Aptech Africa
20 minutes	<b>Audience Q&amp;A</b>
<b>Closing remarks</b> 2 minutes	<b>Mr. Deepak Mohapatra</b> Senior Officer – Business & Market Development, ARE

The [Alliance for Rural Electrification](#) (ARE) is the global association for the decentralised renewable energy (DRE) industry, catalysing private sector-driven markets for sustainable electricity services, creating jobs and powering equitable green economies.

**#1**

Global DRE  
association

**200+**

Members

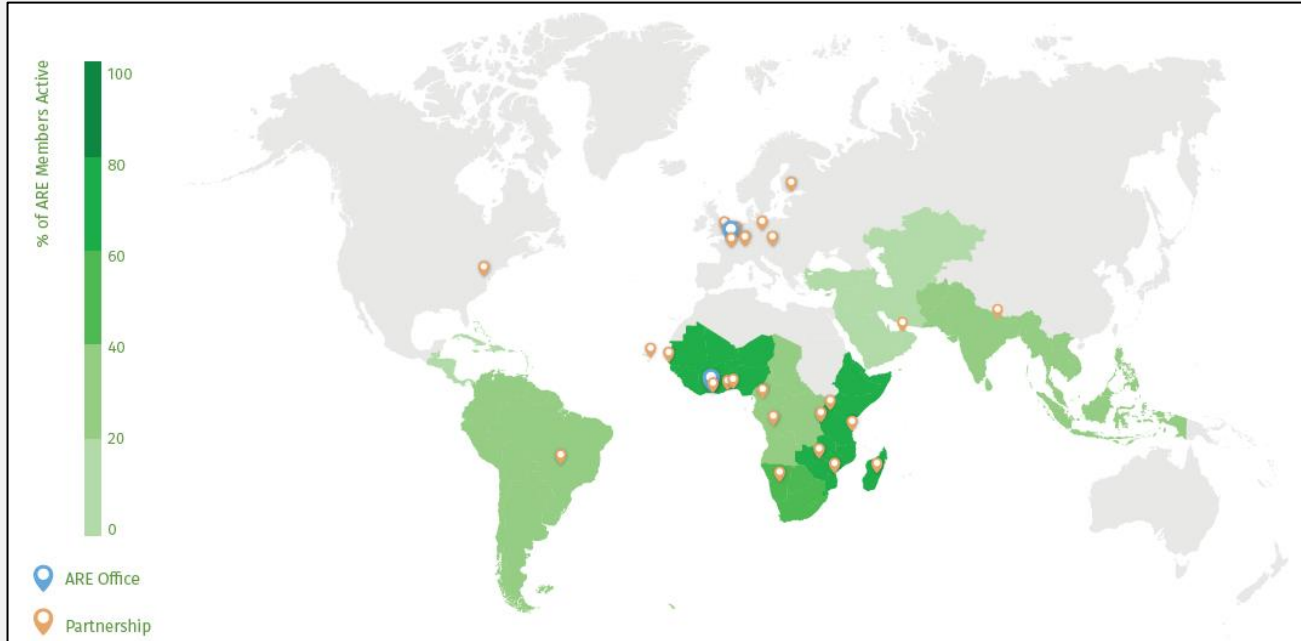
**55+**

Countries

**3**

Continents

# ARE Members Regional Focus & Expertise



## ARE Members **Technologies**



## ARE Members **Systems**



## 1. Business & Market Development



## 2. Capacity Building



## 3. Policy & Advocacy



## 4. Communications & Marketing



Facilitated by



**Mr. Deepak Mohapatra**

Senior Officer – Business & Market Development  
Alliance for Rural Electrification

# Industry Announcement



**Ms. Nadja Katnani**

Project Manager  
Messe Augsburg





 **OFF-GRID**  
Expo + Conference

## OFF-GRID Expo+Conference (OEC)

The hotspot to meet international experts for self-sufficient power supply with green energy

Industry Partner:



Augsburg 2023



## SHORT SURVEY FOR VISITORS & EXHIBITORS –

THANKS FOR SPENDING ONLY A FEW MOMENTS TO SHARE YOUR THOUGHTS WITH US TO HELP IMPROVING OEC



<https://bitly.ws/3dSzS>

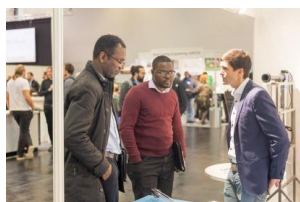


The two-days event is the only neutral congress trade event in Europe focused on the **self-sufficient solar, wind and hydropower energy supplies (off-grid sector)**. With its practice-oriented format consisting of a conference, trade fair and community network happening, it is the highlight in Augsburg, Germany.

Launched in 2011 as a workshop (by Phaesun), the event attracted more and more participants and met with ever-increasing enthusiasm, also among exhibitors and event partners. Since 2020 the Alliance for Rural Electrification is the official conference partner of the Off-Grid Expo+Conference.

# Some impressions

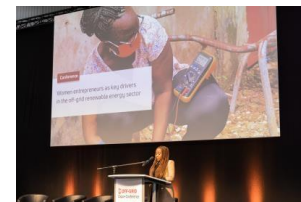
## OFF-GRID Expo



## OFF-GRID Networking



## OFF-GRID Conference



## OFF-GRID TechDay



[See more on the video](#)

# Portfolio for independent Green Energy Supply & Cross Services

<p><b>Energy Production</b></p> <ul style="list-style-type: none"> <li>✓ Biogas</li> <li>✓ Bioenergy</li> <li>✓ Geothermal</li> <li>✓ Hydropower</li> <li>✓ Photovoltaic</li> <li>✓ Solarthermal</li> <li>✓ Small Wind-energy</li> </ul>	<p><b>Energy Storage</b></p> <ul style="list-style-type: none"> <li>✓ Cold Storage</li> <li>✓ Energy Storage Heat</li> <li>✓ Energy Storage Electricity</li> <li>✓ Energy Storage Salt</li> <li>✓ Fuel cells</li> <li>✓ Hydrogen Storage</li> </ul>	<p><b>Distribution &amp; Management</b></p> <ul style="list-style-type: none"> <li>✓ Back-Up</li> <li>✓ Maintenance</li> <li>✓ Micro-Grids</li> <li>✓ Mini-Grids</li> <li>✓ Monitoring</li> <li>✓ Software</li> <li>✓ Stand-Alone</li> </ul>	<p><b>Energy Use</b></p> <ul style="list-style-type: none"> <li>✓ Agri PV</li> <li>✓ Cooling</li> <li>✓ Commercial &amp; Industry</li> <li>✓ Desalination/ Drinking water</li> <li>✓ Pumping</li> <li>✓ E-mobility</li> <li>✓ Entertainment/ Communication</li> <li>✓ Institutions (Health, education...)</li> <li>✓ Lighting</li> </ul>
<p><b>Financing</b></p> <ul style="list-style-type: none"> <li>✓ Financial Support</li> <li>✓ Public &amp; private investors</li> <li>✓ Pay-as-you-xx</li> <li>✓ Crowdfunding</li> <li>✓ Carbon Credits</li> <li>✓ Bitcoins</li> </ul>	<p><b>Cross Services</b></p> <ul style="list-style-type: none"> <li>✓ Planing</li> <li>✓ Project control</li> <li>✓ System design</li> </ul>	<p><b>Policy</b></p> <ul style="list-style-type: none"> <li>✓ Stakeholder-Involvement</li> <li>✓ NGOs</li> <li>✓ Public Organisations</li> </ul>	<p><b>Education &amp; Science</b></p> <ul style="list-style-type: none"> <li>✓ Institutes</li> <li>✓ Research</li> <li>✓ Training</li> <li>✓ Universities</li> </ul>



# Multi-action concept

## OFF-GRID Expo

Physical trade fair – about 50 exhibitors are presenting innovations, services of entire off-grid portfolio

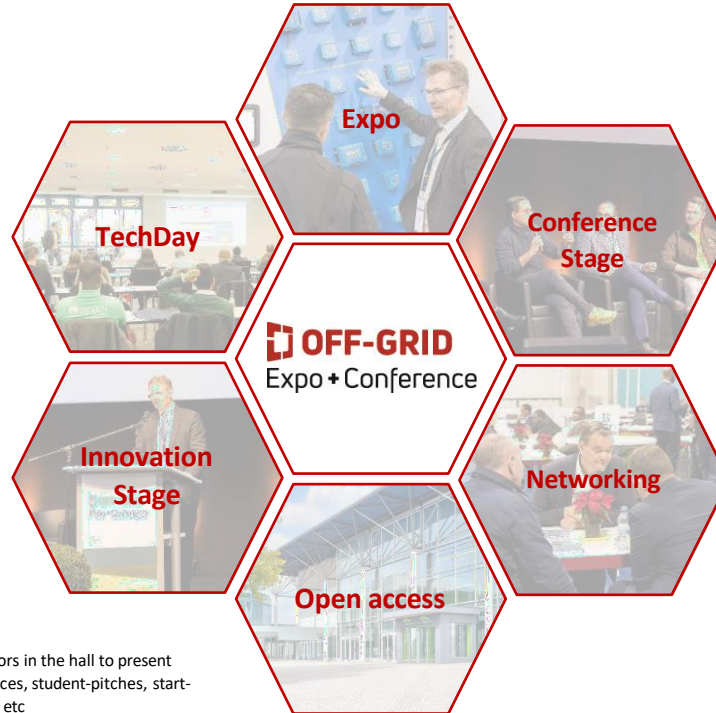
- **Young Talent Campus** "Education Mile" with universities and institutes of the sector, including pitch of students (OFF-GRID Challenge)
- **OFF-GRID Charity:** Proceeds from the sale of donated products go to a good cause

## OFF-GRID TechDay

- TechDay at the Conference Center on the day before. In timeslots exhibitors can offer **product and service workshops** tailored for the OEC visitors.
- Accessible for all ticket-holders

## Innovation Stage

- Additional stage for exhibitors in the hall to present latest innovations and services, student-pitches, start-up presentations and more etc



## Conference Stage

- Main stage in the hall for 2-days of interactive, English-speaking program with **high-quality sessions and panel discussions** with more than 50 international top-class speakers
- From users for users: Insights into the latest innovative and practical projects
- **Industry partner:** Alliance for Rural Electrification



## Networking-hotspot

- Great opportunities for **intensive networking** with the international off-grid community by **Matchmaking** sessions, **get-together** in the evening and more
- **THE annual network happening** at the end of the year to set the mood for the following year
- **900\* participants** from over **30 countries** (especially Northern and Southern Europe, East-Africa, Sub-Saharan Africa, South East Asia)

## Open access

- **Hall 1** at Messe Augsburg – the modern venue with short ways to all offers
- All visitors can benefit of TechDay & Expo+Conference – just **one ticket for all**

Keynote: Prof. Dr. Stefan Liebing, CEO Conjuncta (former chairman of the German-African Business Association)

## Panels:

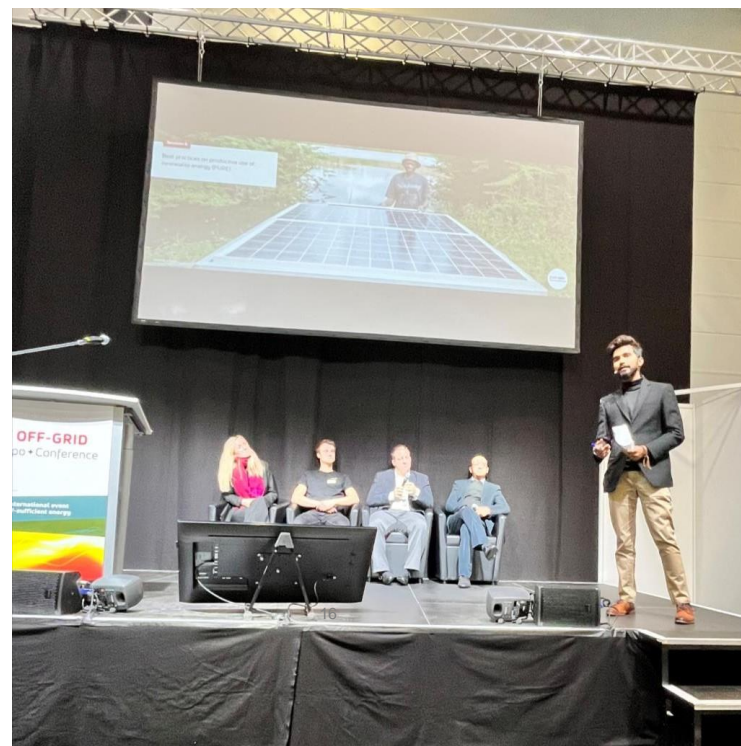
1. **Women entrepreneurs and off-grid renewable energy – A status-quo check!**  
(Moderator German-African Business Association, Wiebke Polomka)
2. **Technical innovations in the off-grid energy sector with small wind systems**  
(Moderator Airborne Wind Association, Stefanie Thoms)
3. **Integrated solar cooking – Opportunities and challenges for cooking with the power of sun in developing countries**  
(Moderator GIZ, Dorothea Otremba)
4. **Utilisation of green hydrogen for off-grid energy access**  
(Moderator Bayern Innovativ, Prof. Dr. Oliver Mayer)
5. **Energy Storage Solutions - providing uninterrupted energy supply**  
(Moderator ARE, Deepak Mohapatra)
6. **Best practices on productive use of renewable energy (PURE)**  
(Moderator ARE, Deepak Mohapatra)

## Best practices on productive use of renewable energy (PURE)

*Productive use encompasses a wide range of sectors, including agriculture, industry, and residential settings, where renewable energy technologies can enhance productivity, create jobs, and promote energy access, ultimately contributing to a more environmentally responsible and economically viable future. In this session, the speakers will showcase their projects and solutions highlighting the implementation of productive use of renewable energy.*

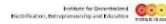
Mr. Shaukat Ali	Rural Electrification Expert , GIZ, Pakistan
Mr. Florian Martini	Project Manager, Phaesun GmbH
Mr. John Zamick	Founder & CEO, SMARTER MICROGRID LIMITED
Mr. Tobias Merkel	Managing Director, SOLAR23 GmbH
Ms. Madeleine Raabe	Junior Researcher International Energy Transitions, Wuppertal Institut für Klima, Umwelt, Energie gGmbH

Ask for recordings of the conference: [oc@messeaugsburg.de](mailto:oc@messeaugsburg.de)





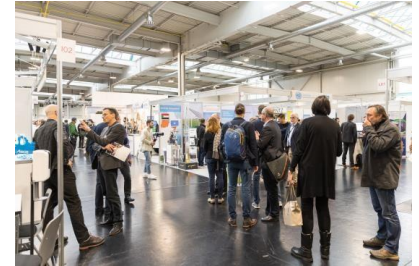
# Do you want to support us as a partner? (abstract of partner list)



Join the community as an exhibitors!  
(abstract of participants)



# Augsburg – Germany



## Add-Ons: Discover Augsburg – the unique water management and much more!

The Augsburg water management system is unique worldwide with its design and was therefore inscribed on the UNESCO World Heritage List in 2019 with a total of 22 items, including drinking water works, monumental fountains, hydraulic structures, power plants, watercourses and canals.

Augsburg has a history that dates back over 2,000 years and is considered the second oldest city in Germany: Fuggerstadt (an official epithet for the cities of Augsburg and Weißenhorn) and Mozartstadt (the cities of Augsburg, Prague, Salzburg and Vienna. About 100km from Munich Airport.



[See more about places of interest](#)





**See you at next OFF-GRID Expo+Conference!**

## Please feel free to get in touch with us!



**Nadja Katnani**

+49 (0)821-2572- 202

[Nadja.katnani@messeaugsburg.de](mailto:Nadja.katnani@messeaugsburg.de)

[Sandra.boeck@messeaugsburg.de](mailto:Sandra.boeck@messeaugsburg.de)



**Sandra Boeck**

+49 (0)821-2572- 203



**OFF-GRID Expo+Conference**

Website: <https://www.off-grid-expo.com>

LinkedIn: <https://www.linkedin.com/company/off-grid-expo-conference/>

Contact us: <https://www.off-grid-expo.com/contact/contact>

Messe Augsburg  
Am Messezentrum 5  
86159 Augsburg

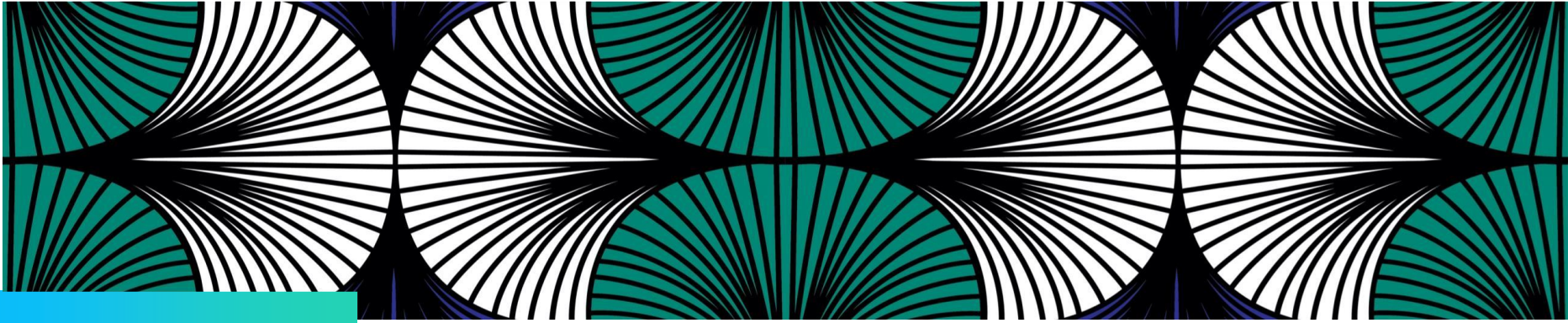
T +49 821 2572-0  
F +49 821 2572-105

[info@messeaugsburg.de](mailto:info@messeaugsburg.de)  
[www.messeaugsburg.de](http://www.messeaugsburg.de)

# Multi-technology white paper presentation



**Ms. Diane Domkam**  
Public Affairs Manager  
ENGIE Energy Access



# **Towards universal access to energy: Enabling a multi-technology approach in a mini grid environment**

I4E: Powering Industries & Productive  
Uses of Energy with DRE

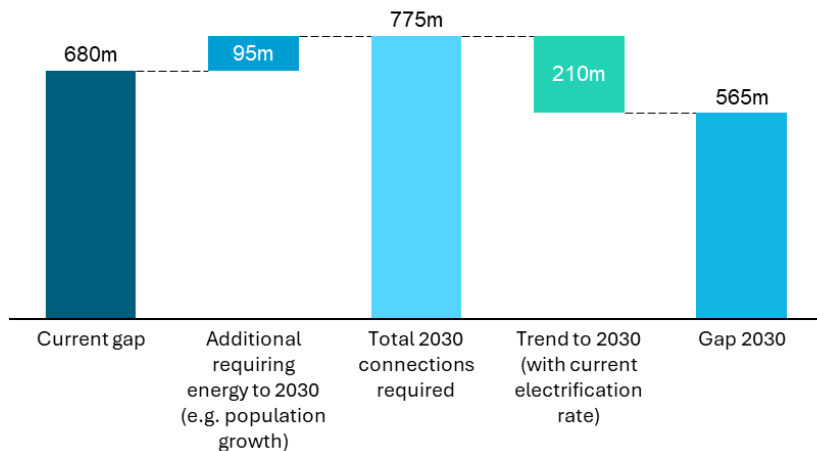
29 February, 2:00 – 3:30 PM



# We are off-track to achieve SDG7

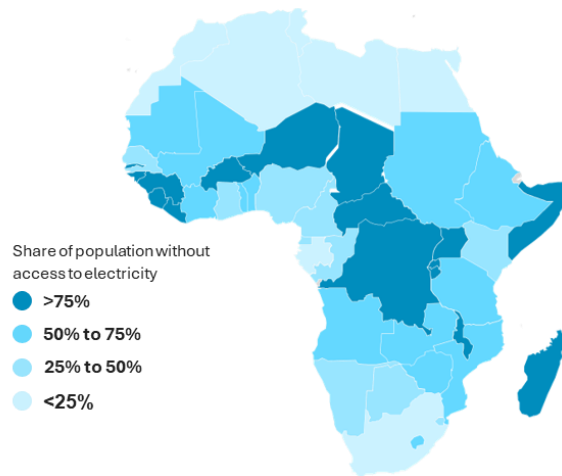
**At current rates of electrification, a gap of over 550m people is still estimated to remain by 2030**

*Projected Electrification Gap to 2030*



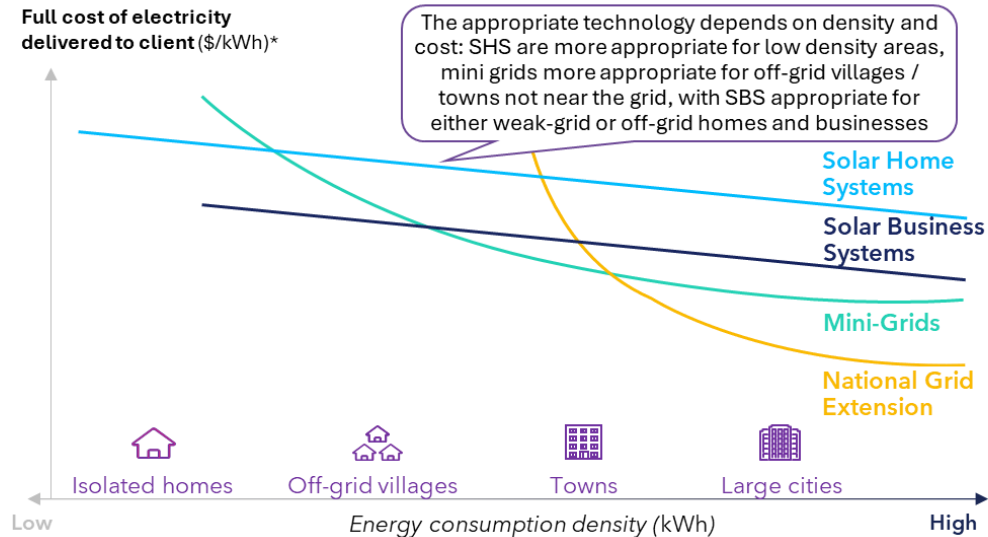
**Sub-Saharan Africa concentrates the lowest rate of electrification on the planet**

*Current Electrification Rates*

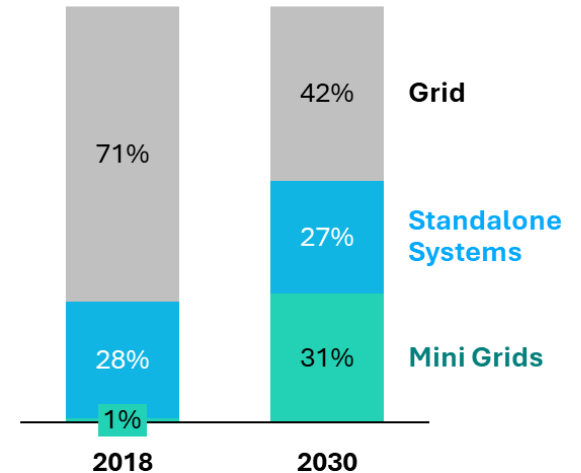


# We need an integrated multi-technology approach to achieve SDG7

A multi-technology approach across solar home systems, mini-grids, and solar business systems is critical to electrification



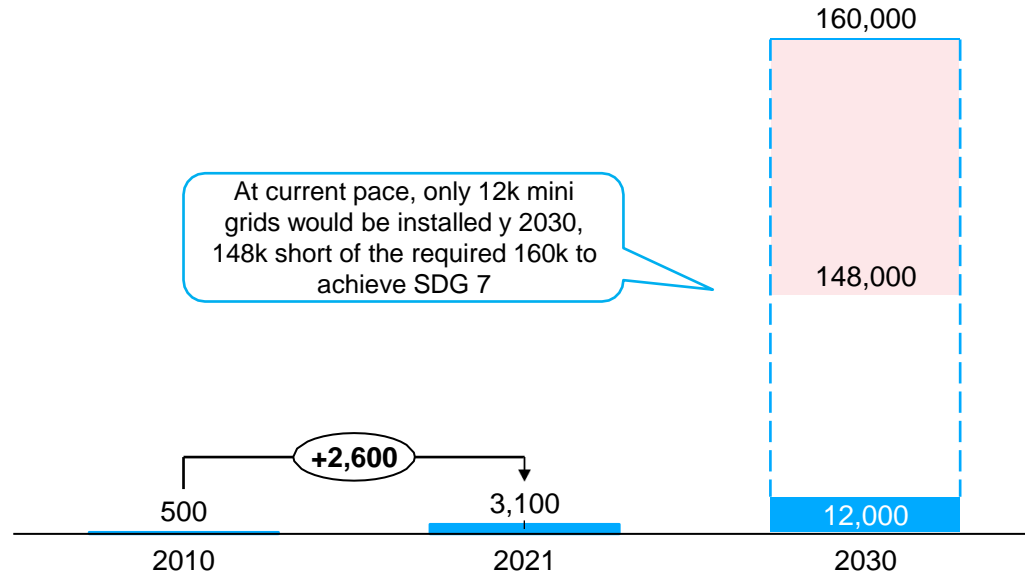
Off-grid solutions will dominate the market by 2030, with mini grids expected to play a big role



# Mini-grids are significantly behind

Number of mini-grids installed from 2010 to 2021 and the projected numbers for 2030

Required pace  
Current pace

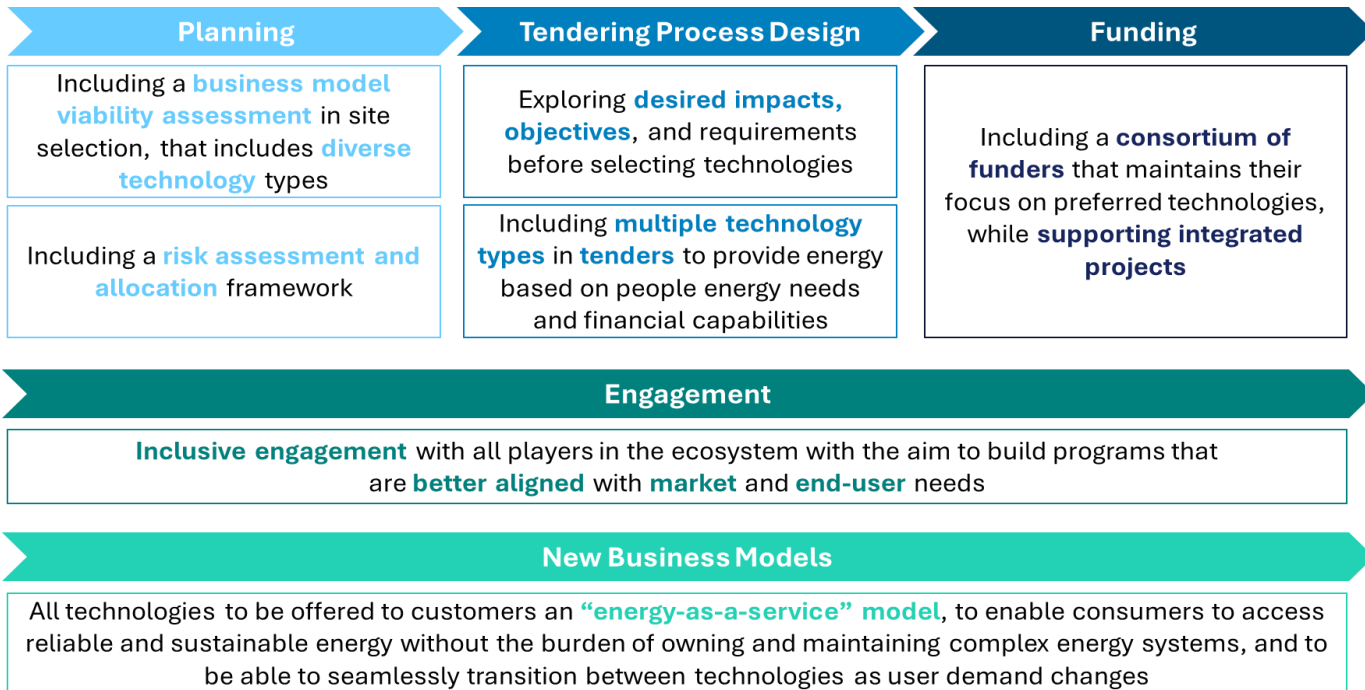


## **Our conclusion is that we have not yet successfully implemented the multi-technology approach**

---

- 1** At the **aggregate** level (given mix is still skewed towards grid and SHS, not mini grids)
- 2** At the **site** or **community** level, given limited coordination of procurement and synergies across technologies

# Improved planning, tendering, funding models, and stakeholder engagement



# ENGIE Energy Access vision for the electrified rural community of the future







**Mr. Christopher Pye**  
Global Segment Manager for Hybrid Microgrids  
ComAp





# Why Investing in Hybrid Microgrids Makes Business Sense?

## Three Perspectives

**Chris Pye**

Global Segment Manager for Hybrid  
Microgrids

# Hybrid Microgrid Investments Globally

› **10 – 12% market growth globally**

## Why?

- › Rising prices of gas, fuel and electricity
- › Decarbonisation of PG and transportation sectors
- › Supplying the growing energy demands and serving those with limited or no access to electricity

# Hybrid Microgrid Investments Globally



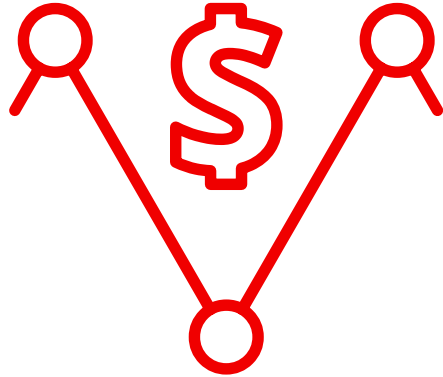
**Which will be the Fastest Growing Regions by 2031?\***

- › Asia Pacific
- › Middle East and Africa
- › Latin America

\*[According to a report by Guidehouse from 2022](#)



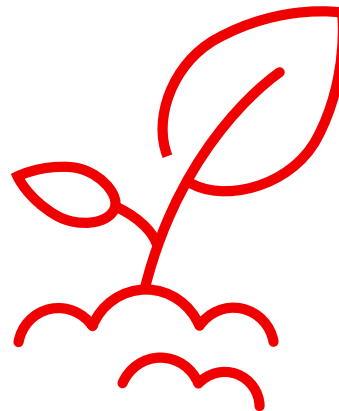
# #1 Commercial Perspective



- › Rising energy prices
- › Privatisation of energy markets
- › Cost effectiveness of RES
- › Quick ROI
- › Time to Market (easy to setup, modular, scalable)

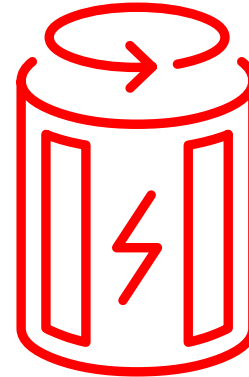
## #2 Sustainability Perspective

- › Carbon and methane emissions limitation
- › Energy security
- › Energy quality
- › ESG



# #3 Technical Perspective

- › Network transformation and reconfiguration
- › Electrification of the transportation industry
- › Peak demand exceeding base demand
- › Energy Shifting



# Market Disruptors – Renewables & Storage

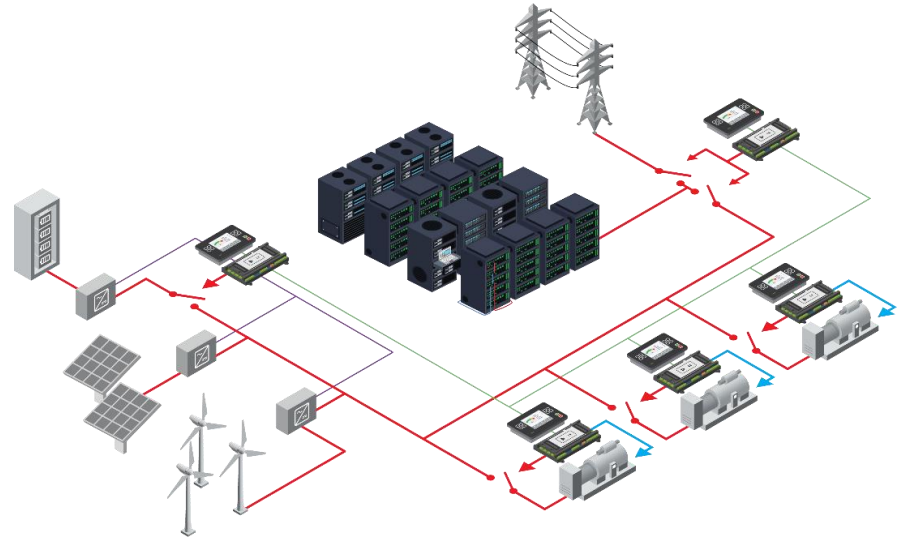
## › 1st wave - Renewables

- › Low MC2O
- › Scalable/Modular
- › Time to market
- › Zero emissions

## › 2<sup>nd</sup> wave – Short-term Storage

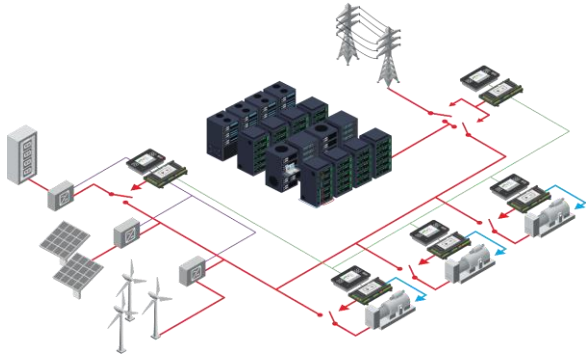
- › Firming renewables
- › Energy shifting
- › Increasing resilience of traditional networks
- › Energy security

## › 3<sup>rd</sup> wave...

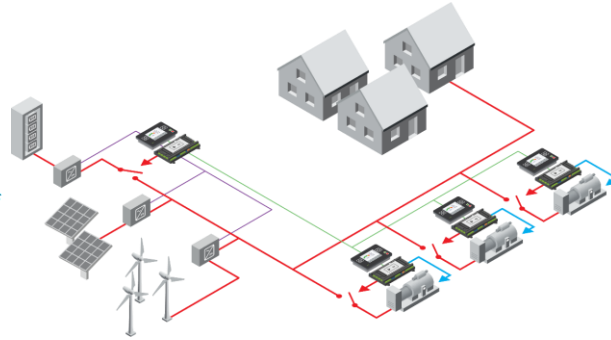


# Application Categories

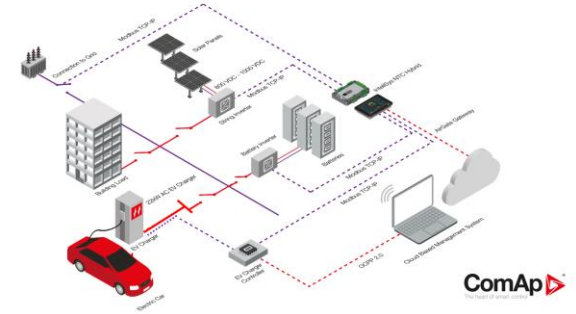
## On-grid



## Off-grid or isolated

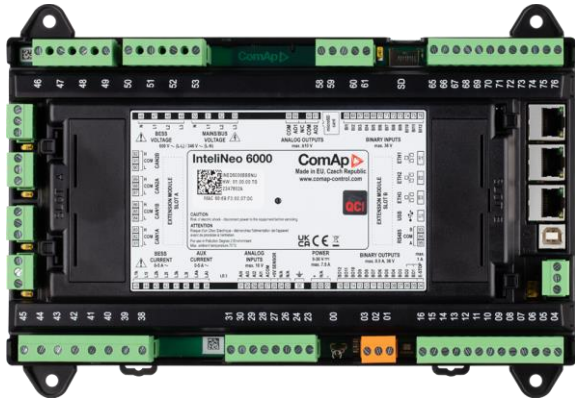


## EV charging integration





# ComAp's Microgrid and BESS Controls





# ComAp's Hybrid Service Offering

Project Development Support

Hybrid Control System Design

Grid Connection Management

System Configuration  
& Testing

Commissioning



# Thank you!



**Christopher Pye**

Global Segment Manager for Hybrid Microgrids

[chris.pye@comap-control.com](mailto:chris.pye@comap-control.com)

**comap-control.com**



**Mr. Marco Honsberg**  
CTO  
EMPO-NI



## Tailor made PV-off-grid solutions for battery charging, productive use and water pumping

Solar technology for off-grid applications

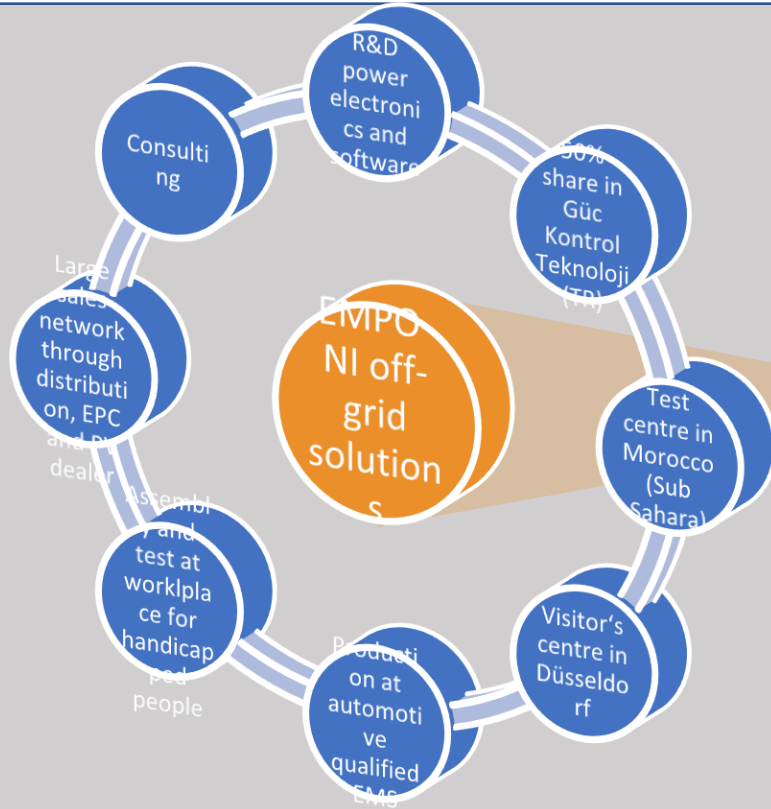
EMPO-NI off-grid solutions – Wernigeroder Strasse 102 – 40595 Düsseldorf – [sales@empo-ni.de](mailto:sales@empo-ni.de)

Copyright EMPO-NI 2020 Errors and omissions excepted



# EMPO-NI facts:

Innovations in off-grid solutions since 2007



# Off-grid technology:

Charging, controlling and driving off-grid applications



## PaygOps

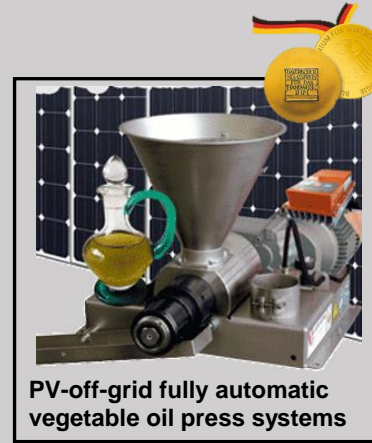
Last-Mile Management System



Solar panel integrated battery charger (5Wp-80Wp 12V-48V)



Solar Panel MPPT controlled motor drives with GSM option



PV-off-grid fully automatic vegetable oil press systems



PV-pumping solutions  
PV-productive use solutions

Technology MADE in Germany

Engineered and MADE in Germany





# SOLAR DIRECT DRIVES:

(SDD1.5kW-425V and SDD5.5kW-850V)

Driving 3-phase motors anywhere: PV-PUMPING, PRODUCTIVE USE...



**Driving 3-phase motors of any application of up to 5.5kW**

**Made for outdoor: OUTDOOR IP54 (IP65)**

**ENVIRONMENTAL ROBUSTNESS: „Sahara tested“ Ta<45°C)**

**CONNECTIVITY (GSM/SMS)**

**PaygOps**  
Last-Mile Management System

**REMOTE CONTROLLABILITY/ MONITORING**

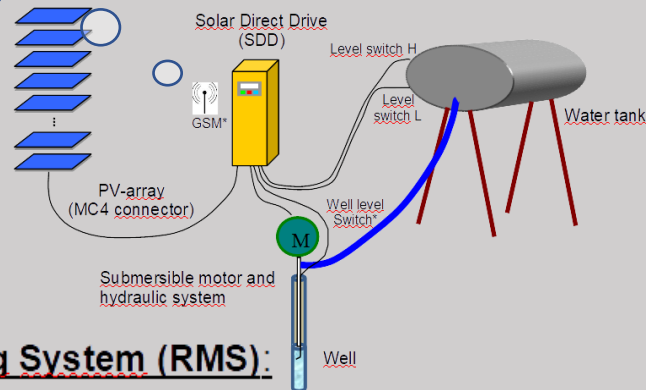
**PAY-AS-YOU-GO implementation**

**PASSIVELY COOLED – no fans / no service required**



# SOLAR DIRECT DRIVES:

Remote monitoring and remote controlling



## Remote Control and Monitoring System (RMS):

- Start & Stop the Solar Direct Drive
- Control over actual and total performance
- Energy counter, Flowmeter input
- Operation parameter: Hours, DC voltage, DC current, heatsink temperature, motor speed etc.
- Error information: Short circuit, over temperature, over voltage, low well water level etc.
- Startmodes: Auto start, Digital in etc.
- RUN timer and STOP timer read / write
- SDD configuration commissioning messages

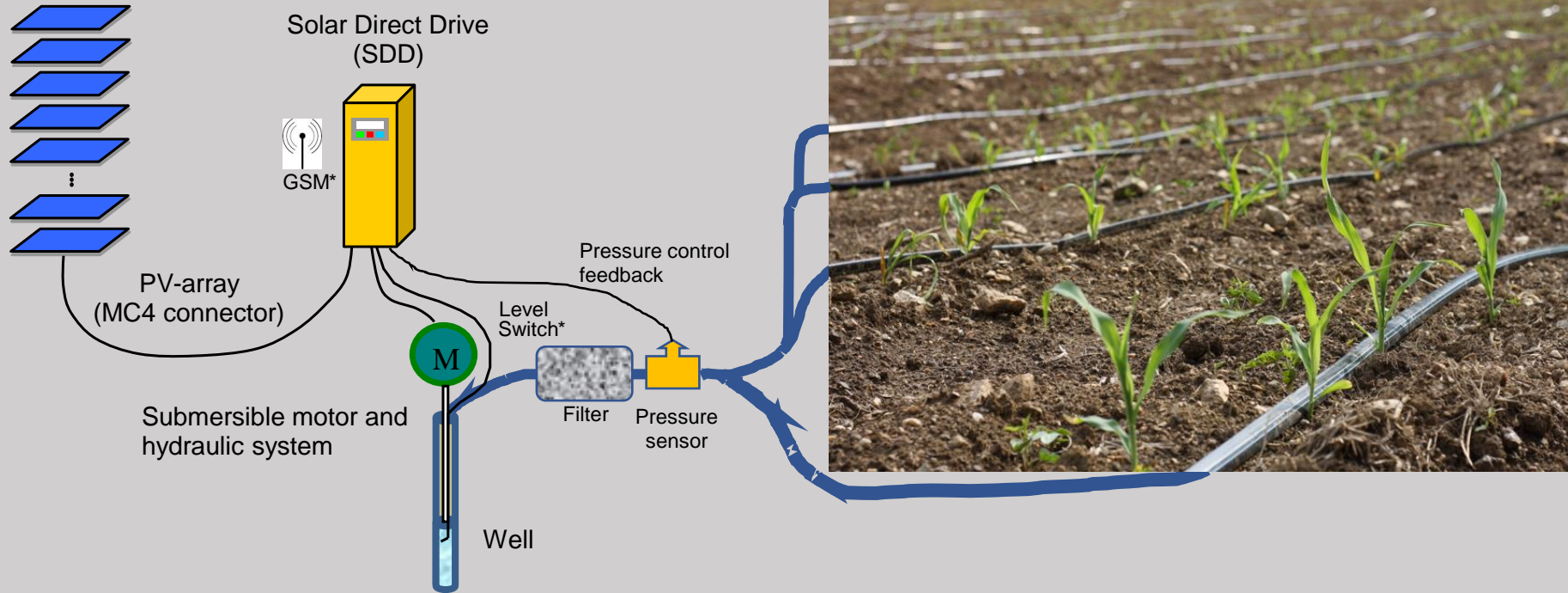


# SOLAR DIRECT DRIVES:

Pressure control - Direct Drip Irrigation:



*emponi*  
off-grid solutions

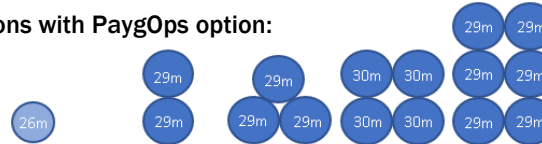




### Nigeria, Jos, Farmer Cooperative: Irrigation and productive use with and without Pay-As-You-Go, for Solar Direct Drives and SOLmini for battery charge controlling



#### Small irrigation solutions with PayOps option:



total irrigated area [m <sup>2</sup> ]	531	1320	1980	2680	3960
maximum circle dia [m]	26	29	29	30	29
Water volume [m <sup>3</sup> /h]	1,5	3,2	4,74	6,48	9,48
hourly water [liter/m <sup>2</sup> ]	2,8	2,4	2,4	2,4	2,4
water gun model	14	2 x 15	3 x 15	4 x 15	6 x 15
Power "P2" [kW]	0,37	0,55	0,75	1,1	1,5
SDD1.5kW-425V / PayGo	✓	✓	✓	✓	✓
qty 60cell PV-panels	3	4	5	7	10
qty 72cell PV-panels	3	4	4	6	8



# Projects and Applications

PV-off-grid vegetable oil press with automatic pre-heating



**emponi**  
off-grid solutions

## ! FOSTER LOCAL VALUE CHAINS AND BUSINESSES !

**EMPO-NI Solar Direct Drive  
off-grid Oil press Kit 1.1kW  
MPPT+ (pre-)heater control**



- Processing up to 20kg seeds / kernels per hour
- Up to 30.000 liter of high quality vegetable oil p.a.
- MPPT digital (pre-) heating and oil pressing control
- 7 PV-panels (60 CELLS) to make it run.
- Compliance with international safety and food processing standards
- using high-quality stainless-steel materials and hardened extruder screws for longest lifetime
- GSM remote control / PAY-AS-YOU-GO ready
- GEO location tracking
- **MADE IN GERMANY**

Winner of 2022  
Bavarian State Award

EMPO-NI off-grid solutions MADE IN GERMANY © 2021

**PaygOps**  
Last-Mile Management System

# PV-solar oilpress overview

**PaygOps**  
Last-Mile Management System



## Typical performances and PV-solar panel requirements

Technical Specifications	EMPRESS0.37kW
Press Form and Method	Screw press / Cold Press Method
Motor Power, #PV-panels 250Wp, 60cells	370 W, only 3 PV-panels of 250Wp min.
System, 3-phase motor MPPT control unit	EMPO-NI SDD1.5kW-425V
Gearbox	Helical Gear Shaft
(Pre-) heating	250 Watt digital temperature controller in SDD1.5kW-425V
Length x Width x Height	840 x 240 x 550 mm
Weight	44 kg
Hourly Capacity	Between 1 and 8 kg // Optimal 3 kg (It may vary according to the input grain size, homogeneity, temperature and purity)
Scope of Application	Food processing, Chemicals, Pharmacy and Others

Technical Specifications	EMPRESS5.5kW (4kW)
Press Form and Method	Screw Press / Cold Press Method
Motor Power, #PV-panels 250Wp, 60cells	4KW (5.5/KW), only 18 PV-panels of 250Wp
System, 3-phase motor MPPT control unit	EMPO-NI SDD5.5KW-850V
Gearbox	Helical Gear Shaft
(Pre-) heating	600 Watts digital temperature controller in SDD5.5KW-850V
Length x Width x Height	1,550 x 800 x 2,200 mm
Weight	550 kg
Hourly Capacity	Between 1 and 80 kg // Optimal 40 kg Varying according to the input grain size,

Technical Specifications	EMPRESS0.75kW
Press Form and Method	Screw Press / Cold Press Method
Motor Power, #PV-panels 250Wp, 60cells	750 W, only 5 PV-panels of 250Wp min.
System, 3-phase motor MPPT control unit	EMPO-NI SDD1.5kW-425V
Gearbox	Helical Gear Shaft
(Pre-) heating	350 Watt digital temperature controller in SDD1.5kW-425V
Length x Width x Height	840 x 240 x 540 mm
Weight	65 kg
Hourly Capacity	Between 1 and 20 kg // Optimal 7 kg (It may vary according to the input grain size, homogeneity, temperature and purity)
Scope of Application	Food processing, Chemicals, Pharmacy and Others

Technical Specifications	EMPRESS1.1kW (1,1kW /1,5kW)
Press Form and Method	Screw Press / Cold Press Method
Motor Power, #PV-panels 250Wp, 60cells	1.1kW / 1.5kW, only 7 (10) PV-panels of 250Wp min.
System, 3-phase motor MPPT control unit	EMPO-NI SDD1.5kW-425V
Gearbox	Helical Gear Shaft
(Pre-) heating	500 Watt digital temperature controller in SDD1.5kW-425V
Length x Width x Height	1.060 x 280 x 590 mm
Weight	85 kg
Hourly Capacity	Between 1 and 40 kg // Optimal 12 kg (It may vary according to the input grain size,

# SOLAR DIRECT DRIVE kits:

For productive use: SDD + industrial motor kit



**emponi**  
off-grid solutions

## SOLAR DIRECT DRIVE 1.5kW-425V

PV powered solutions for agricultural / productive use

SDD1.5kW-425V with MPPT, GSM modem option, IP54(65) protection, passive cooling and with efficient 3-phase motors as solution kit

Suitable off-grid applications:



EMPO-NI off-grid solutions 40231 Dörselsdorf phone: +49(0) 211 381 848 84 www.empo-ni.de Development & Production  
Erkrather Straße 401 Germany fax: +49(0) 211 212 841 86 office@emponi.de Customized Solutions

Replacement of inefficient single phase motors in any motor driven application

EMPO-NI industrial drive kits use a minimum amount of standard PV panels

EMPO-NI industrial induction motors are optimized to operate at low voltage

Number of PV-panels*	Motor Power [KW]	Solar Direct Drive SDD1.5kW-425V	Rated speed at 50Hz	Motor Size	Coupling
3	0,37kW		4p 1450rpm 2p 2850rpm	71	stand food/ flange
4	0,55kW		4p 1460rpm 2p 2870rpm	80	stand food/ flange
5	0,75kW		4p 1450rpm 2p 2860rpm	80	stand food/ flange
7	1,1kW		6p 950rpm 4p 1450rpm 2p 2880rpm	90 (2p and 4p)	stand food/ flange
10	1,5kW		6p 950rpm 4p 1450rpm 2p 2890rpm	90	stand food/ flange
* of 60-cells					



**Drive kits for 2,2kW, 4kW and 5.5kW available**

EMPO-NI off-grid solutions MADE IN GERMANY © 2020

# Applications: Stop Post Harvest Loss

Cooling solutions: Battery less and MPPT controlled coolness



## Solar Direct Drive SDD5.5kW-850V (MPPT)

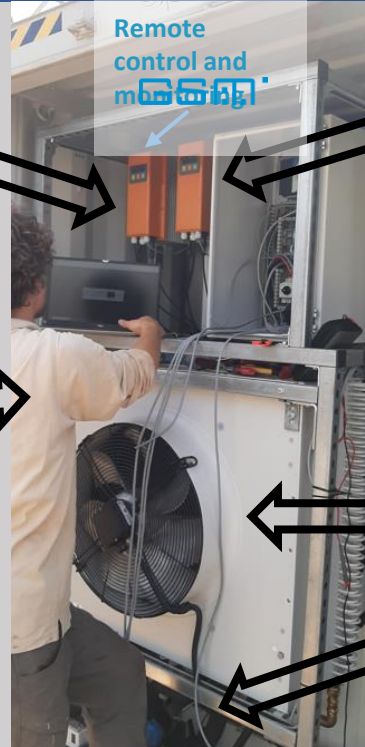
- pressure and temperature control of compressor set
- GSM modem monitoring and remote control
- System control functionality

Remote control and monitoring

## Solar Direct Drive SDD5.5kW-850V (MPPT)

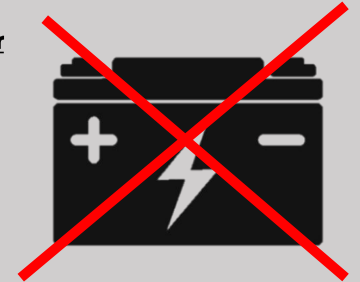
- pressure / temperature control fan
- control of circulation pump
- Enhanced system control functionality

Technical Expert (not on sale)



Heat exchanger / condensor

Compressor set





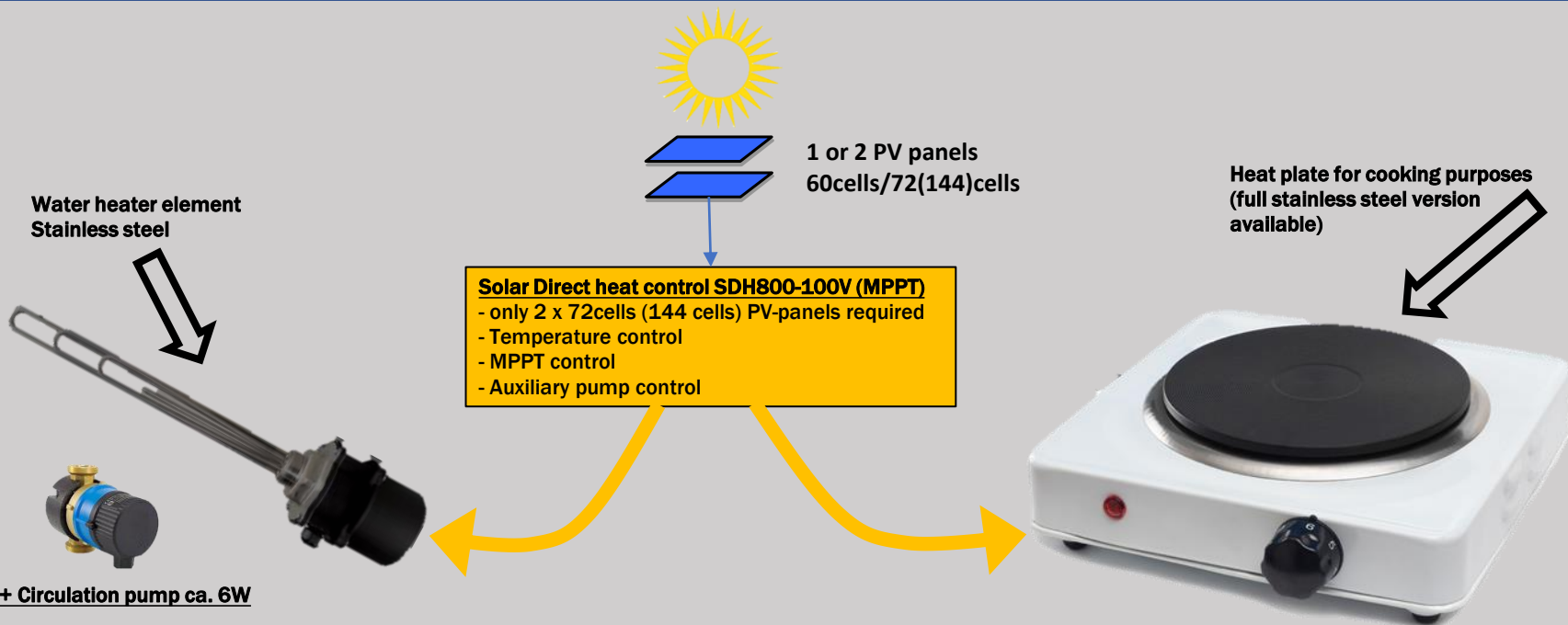
# New Applications: SDH800-100V

COMING SOON (06.2024)



**emponi**  
off-grid solutions

Heating solutions: Cooking or hot water MPPT performance



# SOLAR DIRECT DRIVES:

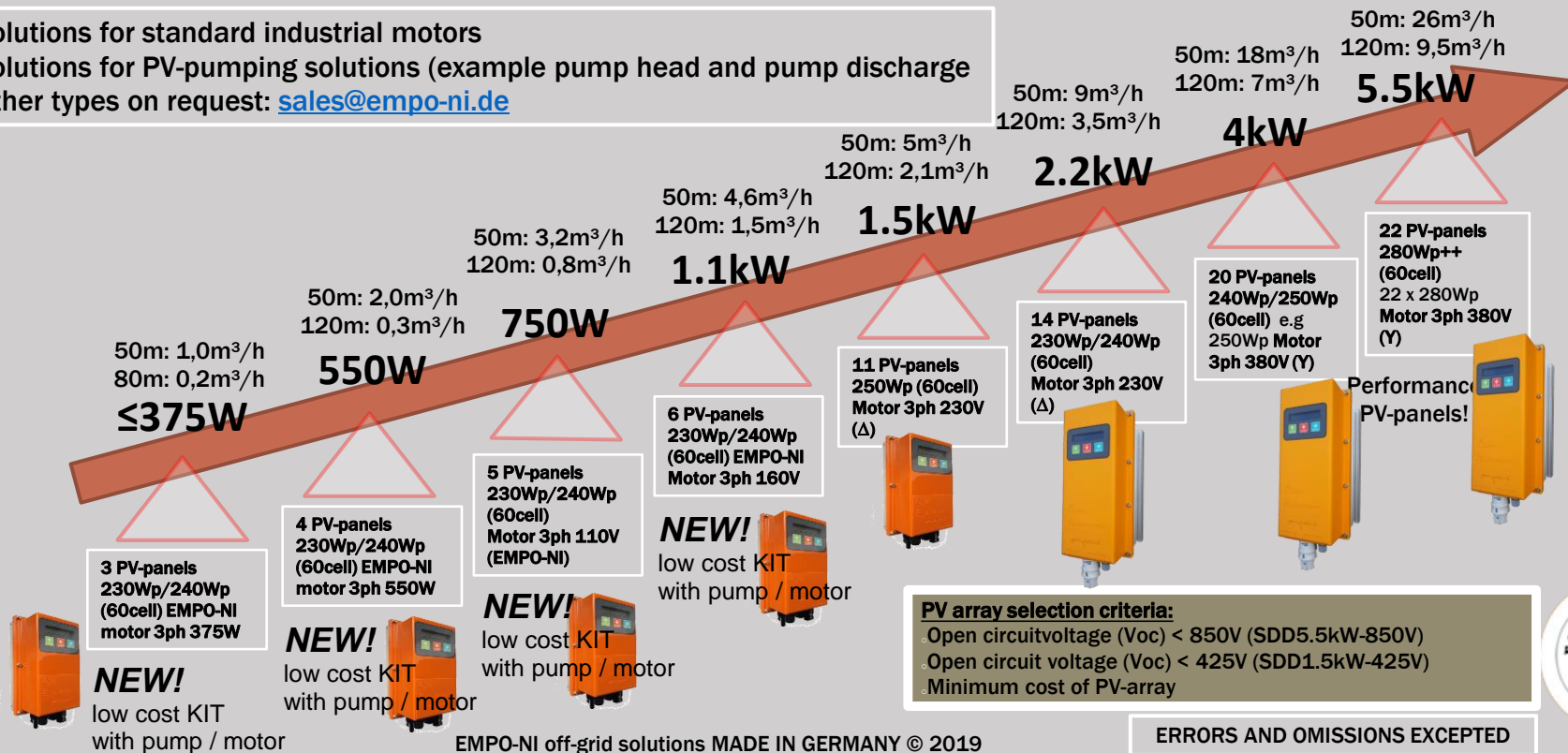


Tailor made motor drive solutions and necessary PV-panel power

Solutions for standard industrial motors

Solutions for PV-pumping solutions (example pump head and pump discharge)

Other types on request: [sales@emponi.de](mailto:sales@emponi.de)



**PV array selection criteria:**  
 Open circuit voltage (Voc) < 850V (SDD5.5kW-850V)  
 Open circuit voltage (Voc) < 425V (SDD1.5kW-425V)  
 Minimum cost of PV-array



ERRORS AND OMISSIONS EXCEPTED

# EMPO-NI off-grid solutions



Contacts:

## **Visitor's centre:**

EMPO-NI off-grid solutions

Erkrather Strasse 401

40231 Düsseldorf

GERMANY

## **Headquarter:**

EMPO-NI off-grid solutions

Wernigeroder Strasse 102

D-40595 Düsseldorf

GERMANY

➤ Contact us for technical inquiries

• [engineering@empo-ni.de](mailto:engineering@empo-ni.de)

➤ Contact us for commercial inquiries:

• [sales@empo-ni.de](mailto:sales@empo-ni.de)

[www.empo-ni.de](http://www.empo-ni.de)



fon: +49 (0) 211 361 848 64

fax: +49 (0) 321 212 841 95





**Mr. Swaleh Hassan**  
Strategic Business Development Manager  
GadgetroniX

# Gadgetronix

UNLIMITED TECHNOLOGIES

⚡ Energy | 💧 Water | 🔒 Security | 📡 Telecoms



## Who we are



**GADGETRONIX**, a leading Tanzanian distributor established in 2014, specializes in Solar Energy solutions alongside Energy, Water, Security & Surveillance, and Communication equipment in East Africa.

Gadgetronix was founded in Tanzania's technology industry in 2014 and is now a supplier, consultant, designer, project implementer, and solution provider for various clean/renewable energy types. We excel in our customer support services with state of the art repair centers across Tanzania.

Working with a team of highly competent employees, including over sixty full-time Expert Technicians, Electrical/Mechanical Engineers, and Quantity Surveyors. Gadgetronix has been able to specialize in a variety of areas, including Energy Solutions, Water Solutions, Security Solutions, and Telecommunication Solutions.

# Where we are



## GadgetroniX Head Quarters

Old NSSF Building, Behind Manji's  
Metropole, Arusha, Tanzania.

+255 677 061 468 / +255 677 146 654



## GadgetroniX Dar Es Salaam

Corner of Nkrumah and Swahili Street,  
Dar es Salaam, Tanzania.

+255 620 602 009 / +255 620 007 170



## GadgetroniX Warehouse

HPVC+V85, Njiro Road,  
Arusha, Tanzania.

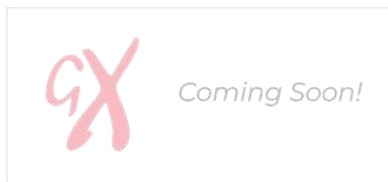
+255 677 146 654 / +255 677 061 468



## GadgetroniX Njiro Complex

Showroom Ground Floor, Shop #2, Njiro  
Shopping Complex Arusha, Tanzania.

+255 677 146 654 / +255 677 061 468



## GadgetroniX Zanzibar

Plot 559, Nyerere Road,  
Along Airport Road, Kiembe Samaki,

+255 677 146 654 / +255 67 7061 468



## GadgetroniX Nairobi

Vishnu Industrial Park, Plot LR No. 2/10728 Ruiru`  
Along Thika Super Highway

+254 722 116 007



## Energy Solutions

1. Off grid solar / Grid tie solar
2. Battery-powered backup systems
3. Solar refrigeration
4. Power Generators
5. Hybrid systems
6. Portable power solutions



1,000+

Solar Power Plants Installed



6MWp

Projects Installed



523,455,633kWh

Electricity Generated Since 2014



1MWh

Battery Storage Installed

## Benefits of Solar Energy



### Saves Money

Tired of paying Electricity Bills? Solar energy provides a free source of electricity with no monthly bills.



### Reliable Electricity

No more power cuts and blackouts. With solar power you can have 24 hour access to power with no interruptions.



### Access Everywhere

Solar power can be connected to your home or business in any location, no matter how remote.



### Saving the Planet

Solar power generates no toxic emission & clean energy without depleting the earth's supply of fossil fuels.





## Water Solutions

1. Solar water pumping
2. Electric water pumping
3. Hybrid water pumping
4. Solar water heating
5. Water filtration / treatment
6. Solar water dispensing



600+  
Water Pumps



400+  
Solar Water Dispensers



2,000+  
Solar Water Heaters



10+  
Water Filtration Projects

### Benefits of our water solutions



#### Cost Savings

Over time, these systems can lead to significant cost savings in terms of reduced energy bills, lower maintenance expenses, and government incentives (where applicable).



#### Energy Efficiency

All our systems are properly designed and maintained and are highly energy-efficient, reducing overall energy consumption and associated costs.



#### Reliable Supply

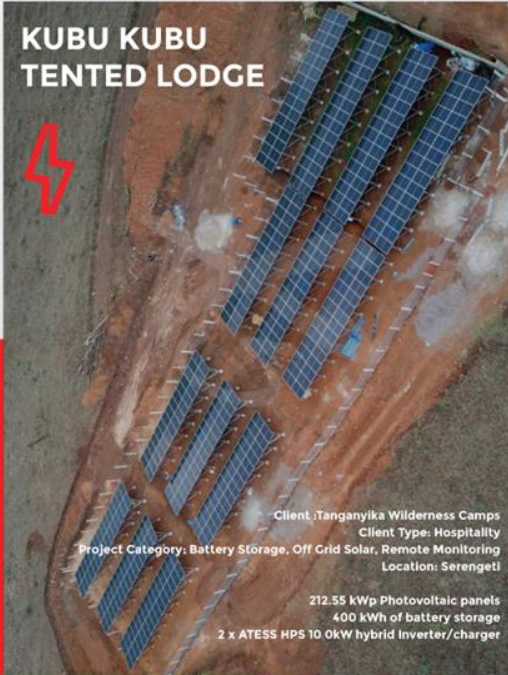
They ensure a consistent and reliable water supply for irrigation, heating, drinking water, or other applications, enhancing overall quality of life and productivity.



#### Environment

Contribute to environmental sustainability by reducing carbon footprint and promoting a cleaner and greener energy source.

# Energy Projects



**KUBU KUBU  
TENTED LODGE**

⚡

Client: Tanganyika Wilderness Camps  
Client Type: Hospitality  
Project Category: Battery Storage, Off Grid Solar, Remote Monitoring  
Location: Serengeti

212.55 kWp Photovoltaic panels  
400 kWh of battery storage  
2 x ATESS HPS 10 0kW hybrid Inverter/charger



**COCOON  
INC/TAWIRI**

⚡

Client: COcoon Inc.  
Client Type: Research Organization  
Project Category: Battery Storage, Off Grid Solar, Remote Monitoring  
Location: Serengeti

2.16 kWp of Photovoltaic panels  
8.06 kWh of battery storage using AES Solar Battery AES12-2870F  
1 x VICTRON Multiplus-II 3.0kVA 24V Inverter charger



**HANSPAUL  
AUTOMECHS**

⚡

Client: Hanspaul Automechs Ltd  
Client type: Manufacturing Industry  
Location: Arusha  
Project Category: power backup, Remote monitoring

40kWh FreedomWon HV LiFePO4 Battery  
ATESS HPS50 110kVA Hybrid Inverter Charger  
Remote monitoring

# Water Projects

## MARUMBI RESIDENCE RESORT



Client: Marumbi Residence Resort  
Client Type: Hospitality  
Project Category: Solar Water Heating  
Location: Zanzibar

10 X Calpak 300L Closed Loop Solar Water Heater

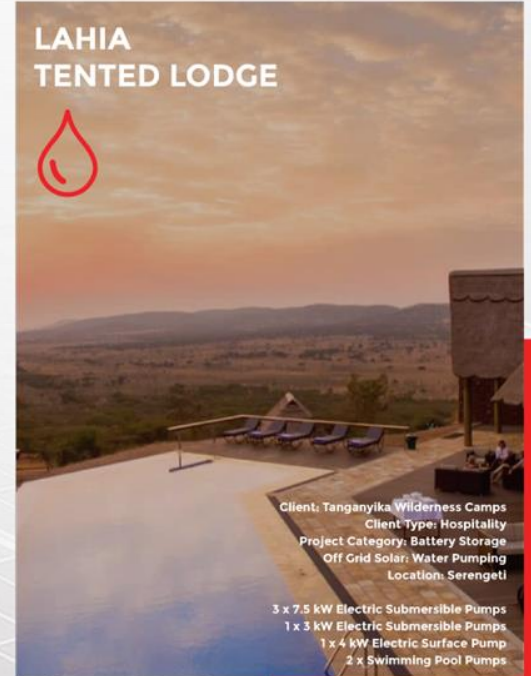
## GAWIDU VILLAGE WATER PROJECT



Client: Gawidu Children's Foundation  
Client Type: Financial Institution  
Project Category: Solar Water Pumping  
Location: Manyara Region

Pump system: LORENTZ PS2-600 HR-10-2  
Total dynamic head (TDH): 75 m  
Flow rate: 10 m<sup>3</sup>/day  
Solar generator: 0.81 kWp

## LAHIA TENTED LODGE



Client: Tanganyika Wilderness Camps  
Client Type: Hospitality  
Project Category: Battery Storage  
Off Grid Solar: Water Pumping  
Location: Serengeti

3 x 7.5 kW Electric Submersible Pumps  
1 x 3 kW Electric Submersible Pumps  
1 x 4 kW Electric Surface Pump  
2 x Swimming Pool Pumps

## Our Product Partners

freedom won

**Fronius**

**LORENTZ**

**ECOFLOW**

**victron energy**  
BLUE POWER

SUN  SYNK<sup>®</sup>

**Ybeier**

**WOCHN**  
GREEN ENERGY

**Eternity**  
TECHNOLOGIES

**AESS**

**AES**  
ADVANCED ENERGY STORAGE

**GOODWE**

**suntree**

**Mern**

**JA SOLAR**

**TROJAN**  
BATTERY COMPANY

**ENERGIE**

**GRUNDFOS**

**Capak**

**LOWARA**  
a xylem brand



## **GADGETRONIX.NET LTD**

[energy@gadgetronix.net](mailto:energy@gadgetronix.net)

[bdm@gadgetronix.net](mailto:bdm@gadgetronix.net)

+255 677 061 468

+255 677 007 111

[www.gadgetronix.net](http://www.gadgetronix.net)



**Mr. Marcelino Silveira**  
Managing Director  
Lighthouse Africa Investments



- ▶ LIGHTHOUSE AFRICA INVESTMENTS is a company registered according to the company laws of the Kingdom of Eswatini in 2020. The main objective of the company is to use renewable sources to generate energy and reusable byproducts to grow the economy in the kingdom of Eswatini.
- ▶ Thus, the four objectives of the project are: -
  - ▶ 1. Produce Energy (Renewable energy)
  - ▶ 2. Job creation (regional value creation)
  - ▶ 3. Increase Agricultural productivity (through natural soil fertilization)
  - ▶ 4. Fight climate change (releasing negative carbon)





- ▶ This is being achieved through the efforts of our knowledge driven team and network of internationally qualified experts within the fields of renewable energy technologies sustainable development and engineering.
- ▶ We are dedicated to creating sustainable solutions and enriching lives by reducing energy poverty, providing long lasting and consistent solutions for households, businesses and communities.
- ▶ LHAi acts seeks to be the Europe-Africa Bridge, transferring proven and innovate technologies to Africa.
- ▶ We enable African technicians and engineers to implement, operate and maintain this technology in Africa. We create local jobs and infrastructure especially in rural areas.



### ➤ **OUR KEY FOCUS AREAS**

Our work aims to bring clean, renewable, reliable electricity to our customers and the grid. Our goal is to help our customers implement micro and mini grid technology using solar and other renewable energy sources for their facilities.

We also provide standalone solar installations, utility scale solar farm development, renewable energy financial services and a wide array of engineering services.

### ➤ **CONSULTING**

Energy Audit & Feasibility Study

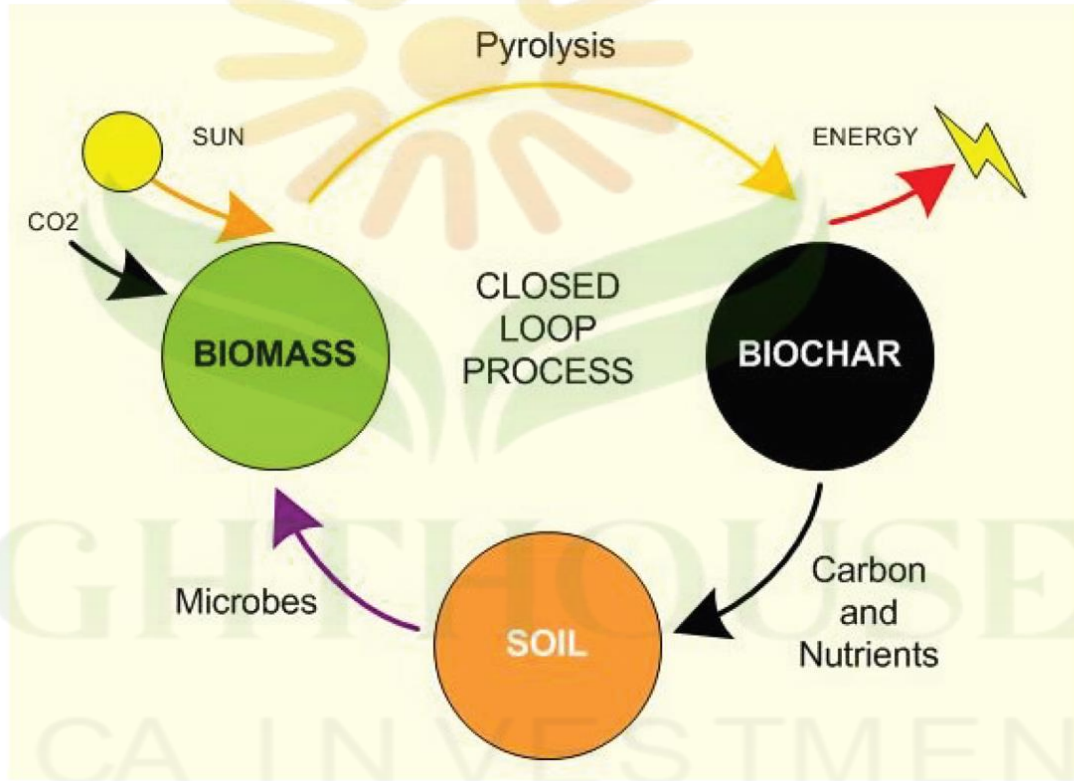
Our consulting services provide insight into the way these projects are developed, financed, installed and operate.

Our goal is to analyze the customer's needs and Energy Management to determine the different ways in which a project can move forward and implement the best plan.

► Bioenergy and CO<sub>2</sub> Capture by nature  
Next Generation Large Scale Biomass  
Utilization



# BioChar Closed Loop Concept



## ► Product



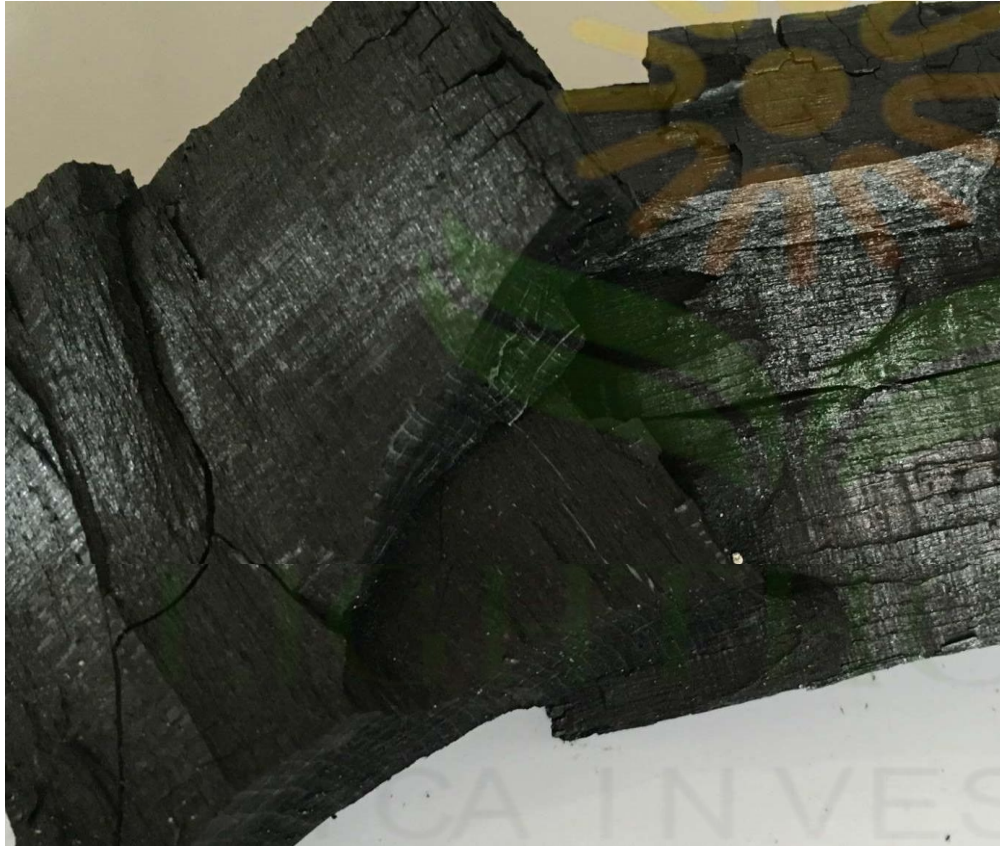
### BioChar Refinery

“We put the charburner’s pile into a box”



- In our special designed retorts (5m<sup>3</sup>), we can control and (1-500mm forest and agricultural biomass)
- No wear and tear
- No moving parts which can get jammed
- Rock solid mechanics with high degree of automation
- Digital SCM and traceability (technology Blockchain)





## **e4f** BioChar Refinery

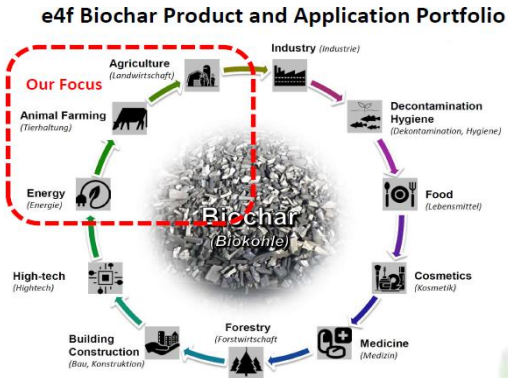
- We achieve a biochar quality of above 98% pure carbon
- Our process is approved by legal authorities to store 3t of CO<sub>2</sub> in 1t of our biochar



## ► Advantages & Market

- Given the fact that there are no plants locally that use biomass to generate energy and sustainable byproducts for consumers, and that all such products are imported from the neighboring South Africa, this puts us at an advantage of being the first in the country to offer such products and fully capture the local market.
- From our plant, one of the byproducts is biochar. Biochar is a fine-grained charcoal made by pyrolysis of agricultural biomass. Biochar is widely used in different kind of industrial application, e.g., in gas purification, gold purification, metal extraction, water purification, medicine, sewage treatment, air filters in gas masks and respirators, filters in compressed air and many other applications. However, the main focus in the Biochar projects in rural agricultural region is the production of Terra Preta for local soil fertilization and carbon sequestration. Terra Petra has been used as a soil improver by many different crops and in numerous regions for over 2500 years.
- LHAJ will have to establish a local market for the Terra Preta and sell it to the agricultural sector in the kingdom for improved crop yields. Instead of importing fertilizer from South Africa, the Agricultural supplies businesses will buy locally thereby reducing costs (importation) and increasing profitability.
- Biochar has different kinds of industrial applications which LHAJ can offer to different customers in the different sectors of the economy as listed below:

## ► Application



- **Medical uses**- Activated carbon is used to treat poisonings and overdoses following oral ingestion. It is also used to treat diarrhoea, flatulence and indigestion
- **Environmental applications** - Activated carbon is usually used in water filtration systems, Spill clean-up, Groundwater remediation, Drinking water filtration, Air purification. Volatile organic compounds capture from painting, dry cleaning, gasoline dispensing operations, and other processes.
- **Agriculture uses** - Activated carbon is an allowed substance used by organic farmers in both livestock production (as a pesticide, animal feed additive, processing aid, nonagricultural ingredient) and as a disinfectant wine making for use as a processing agent to absorb brown color pigments from white grape concentrates.
- **Gas purification** - Filters with activated carbon usually used are in compressed air and gas purification to remove oil vapors, odor, and other hydrocarbons from the air.
- **Chemical purification** - Activated carbon is commonly used on the laboratory scale to purify solutions of organic molecules containing unwanted colored organic impurities.
- **Mercury scrubbing** - Activated carbon, often infused with Sulphur or iodine, is widely used to trap mercury emissions from coal-fired power stations, medical incinerators, and from natural gas at the wellhead.
- Another important benefit to be derived from the production process includes the construction of containers fitted with the district cooling system for cooling or refrigerating farm produce.



## ► SOLAR POWER



## ► Wind Power





### ► Biomass Energy Development

Together with our partners, we are involved in solving socially-created environmental problems through thermal utilisation of agro-industrial biomass waste. The business comprises the design, engineering, delivery and service of biomass plants fired with all forms of biomass, primarily wood chips, wood waste, sander dust and bark, but also other biomass fuels such as distillers grain, poultry litter, and meat and bone meal, as well as straw and other agricultural residue. LHAJ also carries out operation and maintenance, consultancy work, overhaul and maintenance activities, and assists in the optimisation of the operating conditions for existing plants.

### ► Solar Energy Development

We offer engineering and technical support for solar energy access solutions. Our expertise includes all facets of project management, from technical and commercial studies of Solar PV energy options to project feasibility, energy audit, system design, equipment tenders, installation, and after-service support including monitoring and evaluation.

## ► Our team



## ➤ Contacts

- Eswatini

Lighthouse Africa Investments (Pty)  
Ltd

P. Box 2 | Mbabane | H100  
Eswatini

Mr. Marcelino Silveira  
Local Ground Director

Mobile/WhatsApp: +268 7614 1779  
+268 7602 1986  
+27 65 537 5492

Email: [lighthouse.afrik@gamail.com](mailto:lighthouse.afrik@gamail.com)

- Switzerland

Andreas Schimnski

International Director & Partner

Mobile/WhatsApp: +33 6 70 24 93  
73

Email: [schi@agys.com](mailto:schi@agys.com)

- Austria

Anton Aschbacher

International Director & Partner

Mobile/WhatsApp: +43 664 2047462

Email: [anton.aschbacher@e4f.eu](mailto:anton.aschbacher@e4f.eu)

LIGHTHOUSE

AFRICA INVESTMENTS



**Mr. Alban Brice Mongbo**

Founder  
BM Solutions

# Powering Industries and Productive Uses of Energy with DRE



**Presented by Dr. Alban Brice MONGBO**  
**Founder – Head of Business Development**



# Company Presentation



- Founded in 2017 and operating in Contructions and Energy in Republic of BENIN.
- In 2023, the company generated **110,000 USD** as revenue on water solar pumps.
- Our ambition is to become the leading company in Benin in terms of the supply and installation of water solar pumps for **productive use of energy** by 2025.
- Our expansion plan is targetting the small farmers (**<1Ha**) who are around **25,000** in BENIN.
- Ambition **2027: 2,500 solar pumps sold and installed.**



# The problem



## Country status



- **Population : 12 millions**
- **50% of the population are in agriculture,**
- **25% of GDP depends on the agriculture**
- **Agriculture represents 80% of the exportations**



## Agriculture is a key sector in BENIN

- Horticulture and rice producers are located in three main areas: Grand-popo, Seme-Podji and Malanville.
- Their activity requires a huge quantity of water of daily basis.
- They are currently using motor pumps to supply water to the crops.
- **The motor pumps consumption is 2 liters min/day while fuel cost is increasing (1.12 USD per liter).**
- Sometimes, farmers are obliged **to borrow money to buy fuel.** Sometimes, they cannot supply water to crops and this affects the productivity and the revenue.
- Motor pumps required also regular maintenance and can only last one year maximum.

# Solution and Product

## Solution and Product

Our alternative to the situation described previously is the water solar pumps that **eliminates all the fuel expenses and ensure a normal daily water** supply to the crops to replace the current motor pumps.

### Product : solar surface pump

- powered by solar panels
- Supplied with 2 years warranty and 10 years warranty for panels
- Surface pump like the current pumps
- Same water rate as the current pumps
- Removable
- Last up to 8 years
- No maintenance fees



# Results and Feedbacks

**Rice planting**



**Horticulture**



## Market

- Number of customers increases by 25% every year from 2021 (company revenue increased).
- One-time investment (cash or progressive for 2 years only) company to daily expenses in fuel.
- Less stress for farmers because of absence of pump maintenance.
- Revenue increased along with production because of the possibility to produce even in the dry seasons.
- Increase of the resilience of families as their revenue is increasing.

# Our demands



- Manufacturers to reduce the pump prices to increase the affordability for farmers.
- Manufacturers to design PAY-GO enabled products.
- Financing companies to support the local solar companies in products acquisition.
- More capacity buildings for local solar company in order to easily raise funds.
- Increase of the resilience of families as their revenue is increasing.

# Thanks for your attention

**Dr. Ing. Alban Brice MONGBO**

Founder - Head of Business Development

[contact.bmsolutions@gmail.com](mailto:contact.bmsolutions@gmail.com)

Tel: +229 97972941



---

**BM SOLUTIONS**  
Beyond your imagination



**Ms. Laura Corcoran**  
COO  
Aptech Africa



**Ms. Ghirmay Abraham**  
Executive Chairperson  
Aptech Africa



# Bringing Solar Powered Water Pumping Solutions to Somaliland



# EPC Solar Energy and Water Pumping Company



ASSESSMENT



DESIGN



SUPPLY



INSTALLATION



O&M



6 CLEAN WATER AND SANITATION



8 DECENT WORK AND ECONOMIC GROWTH



13 CLIMATE ACTION



7 AFFORDABLE AND CLEAN ENERGY



Mission

## Mission

To provide access to clean electricity and water to improve people's lives.



Vision

## Vision

Aptech Africa as the leading EPC company for implementation of renewable projects across Africa



# Applications

## SOLAR APPLICATIONS



## WATER APPLICATIONS



## POWER TRANSMISSION & DISTRIBUTION



# Challenge of Water Access in Somalia

- Hargeisa
- Dilla Town
- Boroma Town



# Supply and Installation of electromechanical equipment for Laasdhure Boreholes

Item	Site	PV Capacity (KWp)	Installed Diesel Generators
1	Laasdhure - LD4	75.6	100kva
2	Laasdhure - LD10	105.84	150KVA
3	Laasdhure - LD11	60.48	75KVA
<b>Totals</b>	<b>241.92</b>	<b>448</b>	



# Supply and Installation of electromechanical equipment for Four Dilla Dams in Dilla



Item	Site	PV Capacity (KWp)	Installed Diesel Generator
1	Garbida	8.64	10KVA
2	Caro Agaranug	8.64	10KVA
3	Qabridhawed	8.64	10KVA
4	Dilla	8.64	10KVA
<b>Totals</b>	<b>34.56</b>	<b>128</b>	



# Supply and Installation of electromechanical equipment for Boroma water supply improvement project



# Impact



- 1,000,000+ people with access to water





# AptechAfrica

Contact Us!

[www.aptechafrika.com](http://www.aptechafrika.com)

Laura Corcoran  
[laura@aptechafrika.com](mailto:laura@aptechafrika.com)  
+256779135317





## I4E Series: Powering Industries & Productive Uses of Energy with DRE

### Facilitator

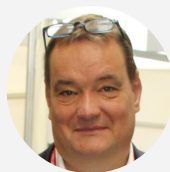
#### Mr. Deepak Mohapatra

Senior Officer – Business & Market Development  
Alliance for Rural Electrification



#### Ms. Nadja Katnani

Project Manager  
Messe Augsburg



#### Mr. Marco Honsberg

CTO  
EMPO-NI



#### Mr. Alban Brice Mongbo

Founder  
BM Solutions



#### Ms. Diane Domkam

Public Affairs Manager  
ENGIE Energy Access



#### Mr. Swaleh Hassan

Strategic Business  
Development Manager  
GadgetroniX



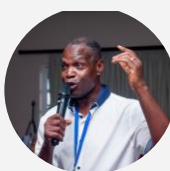
#### Ms. Laura Corcoran

COO  
Aptech Africa



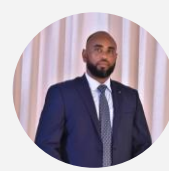
#### Mr. Christopher Pye

Global Segment Manager for  
Hybrid Microgrids  
ComAp



#### Mr. Marcelino Silveira

Managing Director  
LHAI



#### Ms. Ghirmay Abraham

Executive Chairperson  
Aptech Africa

# Closing Remarks



**Mr. Deepak Mohapatra**

Senior Officer – Business & Market Development  
Alliance for Rural Electrification



**Alliance for Rural  
Electrification**

**See you at the next I4E showcase  
webinar on 25.04.2024**

**Innovation**  
for Electrification

[www.ruralelec.org](http://www.ruralelec.org)