

A woman wearing a red and white patterned headscarf and a matching dress is sitting outdoors. She is smiling and looking towards the right. In the background, there is a wall made of mud and sticks. To her right, there is a green power station on a wooden table, a solar panel leaning against the wall, and some electrical equipment. The scene is brightly lit, suggesting daytime.

Access to Energy at Schneider Electric

Life is on for everyone, everywhere, at every moment

Presented by: Gareth Smit

Schneider Electric is leading the digital transformation of energy management and automation

Key figures for 2018

5% of revenues devoted to R&D

€25.7 billion

2018 revenues

42%

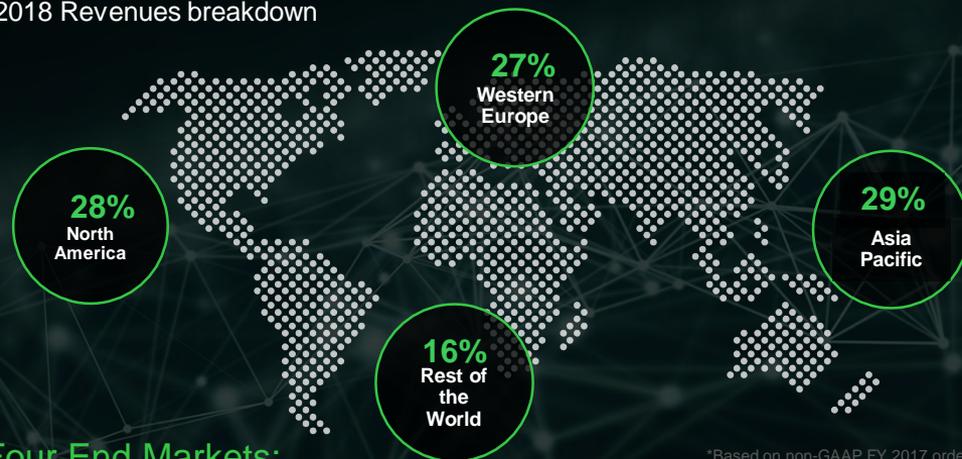
of revenues in new economies

137,000+

Employees in over 100 countries

A well-balanced global presence

2018 Revenues breakdown



*Based on non-GAAP FY 2017 orders

Four End Markets:



3 challenges leading our sustainable strategy

The facts

x1.5

Energy demand

The need

÷ 2

CO₂ emissions

vs

The energy equation

Energy efficiency and resources efficiency are a must **for the planet ... and the bottom-line**

The energy paradox

Find business solutions for long-term development **collaborating with public and private actors**

The rise of awareness

Build a culture and a comprehensive disclosure on environmental, social, and governance data **not only to comply but make it a competitive advantage and a transformation driver**

1

Billion people has no access to electricity

63

Million people live in fuel poverty in Europe



Culture and values



Customer & public



Regulation & ratings

We believe Access to Energy is a basic human right

Our challenge: we want everyone on our planet to have access to reliable, safe, efficient, and sustainable energy



Universal access to energy at the heart of sustainable growth



Reduced poverty



Improved agriculture productivity



Safe lighting, medicine storage & health services



Improved conditions at school and at home & better education in electricity trades



Women integration & entrepreneurship



Access to drinking water & irrigation



Job opportunities and economic development



Decreased rural exodus



No impact on climate change



Energy creates social and economic development, it creates a better life

Health

safe lighting,
medicine storage,
health services

Economical development

agriculture,
entrepreneur
development

Security

public and private
lighting

Education

improved working
conditions at school
and at home

Access to water

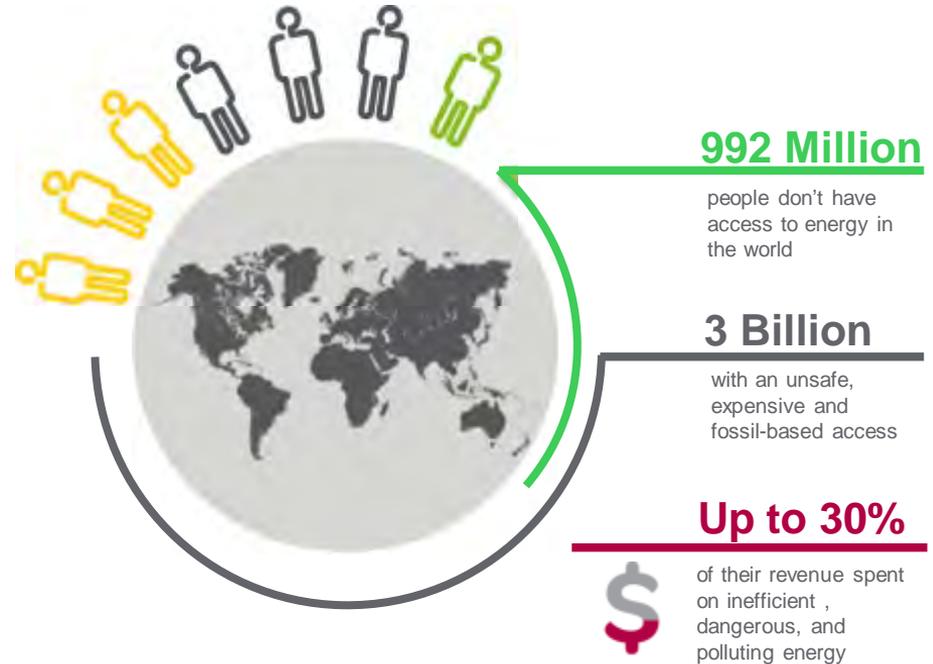
provision of drinking
water and irrigation

Access to electricity

Perspectives in Africa

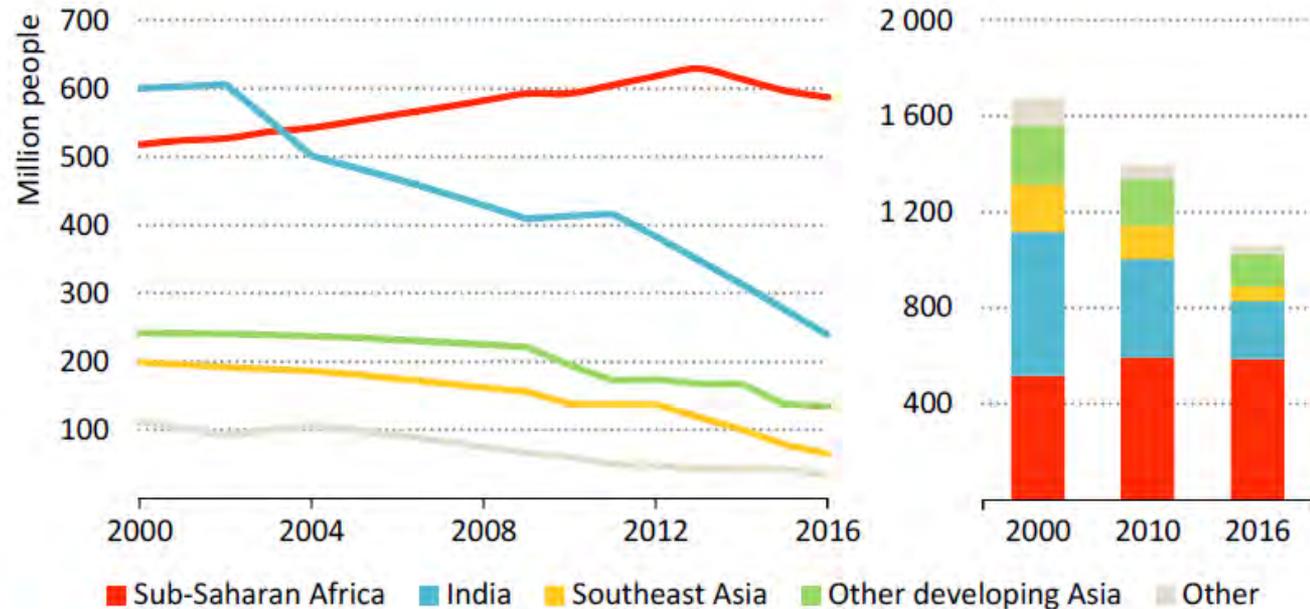
How do you provide energy access to people deprived of it?

According to the International Energy Agency, nearly **992 Million** people still lack access to electricity in 2017.



Progress on electricity access rate is being made in all parts of the world, but to a lesser extent in Sub-Saharan Africa (mainly due to population increase)

- **In 2000-2017**, over 1.3 billion people have gained access globally - Most progress has been made in developing Asia with 870 million
- **600 million** people are expected to gain access to electricity in the next decade – Most progress is expected in Africa
- **By 2030**, there will be 674 million people without access (on business as usual)



Source: International Energy Agency, World Energy Outlook special report: Energy Access Outlook 2017

Life Is On

Schneider Electric

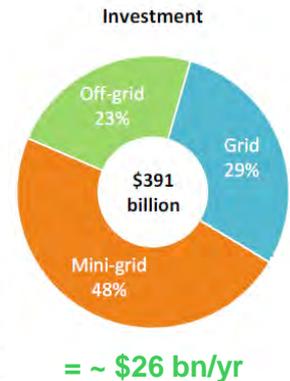
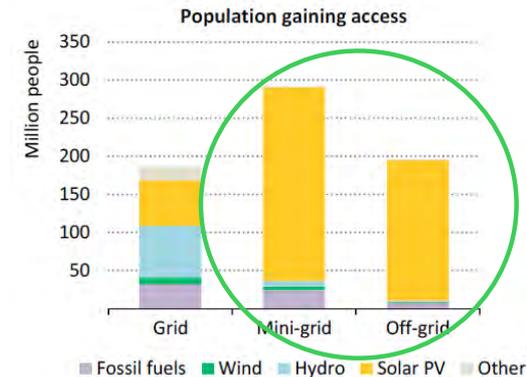
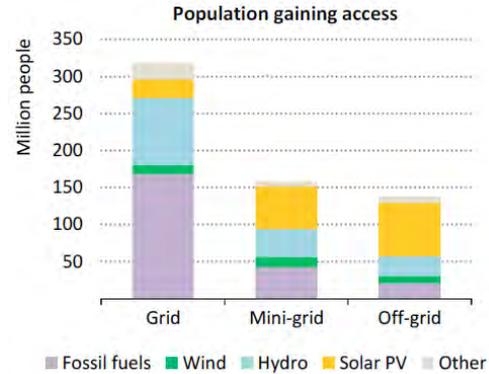
Scenarios point out the need for developing minigrids to reach electricity access targets

- Between 2010 and 2017, over 400 million people globally gained access to electricity from off-grid solar solutions
- And by 2030, an estimated 71% of new electricity connections will be provided via off-grid or minigrid solutions
- Investment gap: Total financing needed to reach universal electricity access by 2030 is at least **\$52 billion USD per year**, more than twice the level mobilized under current and planned policies
- **In Sub-Saharan Africa, industry actors, public institutions and national governments are developing frameworks to help mature the minigrid market**

Current Scenarios



Energy for All case



At the current trajectory, in 2040 95% of the remaining global unelectrified population will be in Sub-Saharan Africa

Contrasted situation + opportunities for electrification:

- **Kenya electrification rate:** up from 8% in 2000 to 73% in 2018
+ the Last Mile Connectivity Project targets **universal access by 2022**
- **Ethiopia electrification rate:** up from 5% in 2000 to 45% in 2018
+ the National Electrification Program targets **universal access by 2025**
- **Burkina Faso electrification rate:** currently at 20% (with 60% of the urban and only 3% of the rural population) and **targeting 80% by 2020**
The Government has taken steps to introduce legislation encouraging private-sector investment and liberalizing electricity generation and distribution
- **Total population in sub-Saharan Africa** without access to electricity remains at **600 million** (57% of population) and 15 countries have access rates below 25%

Source: World Energy Outlook 2018

Schneider Electric Access to Energy program

Enabling the ecosystem

In 2009, we set up an ambitious Access to Energy program with 3 pillars

Offers & business models

For the design and deployment of adequate electrical distribution offers.



Investments

Investment funds for innovative energy entrepreneurship locally.



Training & Entrepreneurship

Train disadvantaged people and sustain entrepreneurship in the energy field.



Achievements as of end of 2018

Energy access solutions provided to **24+ M** people

Investments in **20** energy access ventures

190,000+ people trained in electricity trades

Targets by 2025

Energy access solutions to **50 M** people

3 Investment funds focusing on Sub-Saharan Africa, Europe & Asia

1,000,000 people trained in electricity trades



Investment

Investing in energy access



Impact investing: a strong and long-lasting commitment from Schneider Electric

LAUNCHING OF SCHNEIDER ELECTRIC ENERGY ACCESS ASIA

+20M€ fundraising

Giving access to electricity in South-East Asia & India

LAUNCHING OF ENERGY ACCESS VENTURES

€75M impact fund, co-funded with DFI's

Giving access to electricity in Africa

INVESTMENT IN LIVELIHOODS

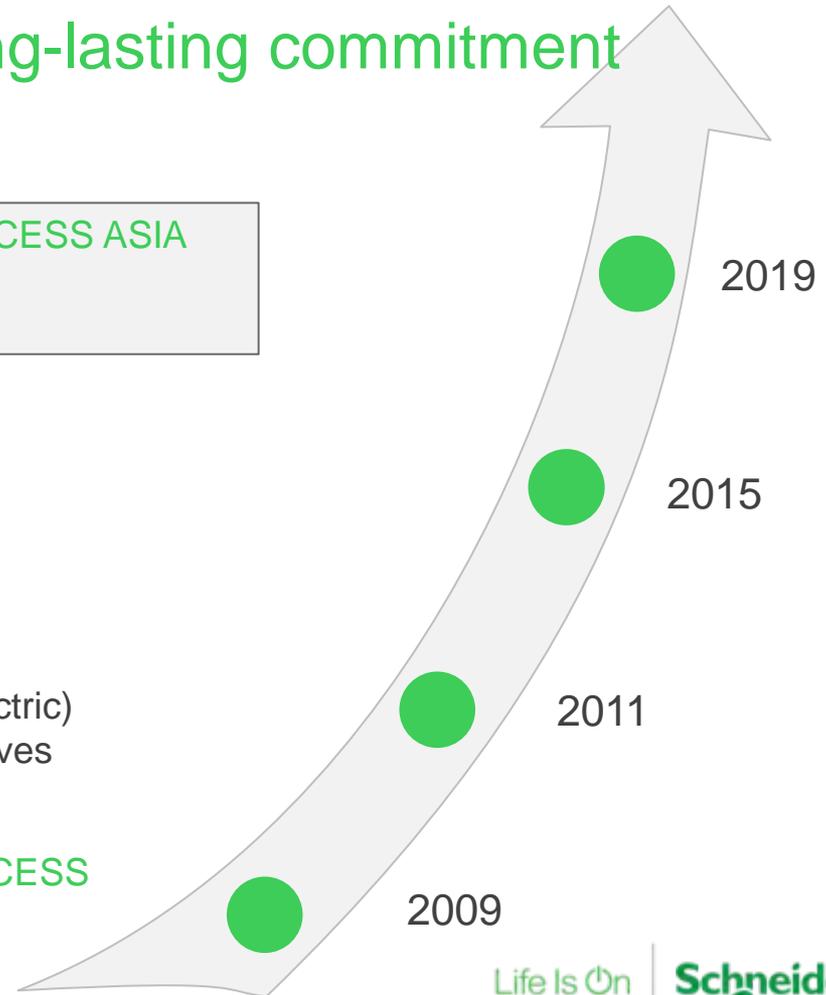
€38M Carbon fund (€5M participation from Schneider Electric)

Backing reforestation, agroforestry and improved cookstoves

LAUNCHING OF SCHNEIDER ELECTRIC ENERGY ACCESS

€7M Solidarity-driven fund

Bridging the energy gap worldwide, 13 investments



Schneider Electric Energy Access – Portfolio overview

SEEA

Amped Innovation, which designs and produces radically affordable solar systems for off-grid communities



SunFunder, a financing company that specializes in companies seeking to increase energy access in emerging



SunFunder

Simpa Networks (exited), which makes modern energy simple, affordable, and accessible for everyone.



Kayer Energie Rurale, a rural social enterprise that builds solar irrigation systems in Senegal



Nova Lumos (exited), which designs remote solar electricity production systems large enough to replace small diesel generators



Fenix International (exited), a social enterprise that develops access to energy solutions in partnership with mobile operators



fenix intl

Life Is On

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Okra, which designs step by step modular picogrids, thanks to a network of plug & play Solar Home Systems, they connect, manage and control



OKRA

Energy Access Ventures – Portfolio overview



Off-Grid Electric (OGE)

- OGE designs, manufactures, deploys, finances and serves **solar home systems** in Tanzania and Rwanda using a Pay As You Go (PAYG) model
- The company operates as a vertically integrated distributed utility, leasing solar home systems to rural and peri-urban households with no access to the national grid
- To date the company has installed over 110,000 systems



Persistent Energy Ghana (PEG)

- PEG focuses on distribution and finance of **PAYG Solar Home Systems** technology
- The company is currently active in Ghana and is planning on expanding to Côte d'Ivoire.
- PEG has >6,000 customers



d.light

- The largest distributed solar lighting brand in the world, with revenues of \$44m in 2015-16
- Originally focused on selling **solar lanterns**, then moved in to the **PAYG Solar Home System** space
- Has sold over 14m solar lanterns and 250,000 Solar Home Systems in 62 countries.
- Fully vertically integrated; designs, manufactures, distributes and finances its products

Energy Access Ventures – Portfolio overview



InspiraFarms

- InspiraFarms produces and sells modular, pre-certified **renewable-powered processing and cold chain solutions** for value addition and loss reduction in small scale agribusiness, enhancing the sustainability of domestic and global supply chains
- The company offers attractive financing to low-income customers as well as offering cash sales
- All InspiraFarms products are off-grid capable and can be powered by renewable energy



SunCulture

- SunCulture designs and sells **solar powered irrigation systems** in Kenya and will expand to other Sub-Saharan geographies
- The company currently sells irrigation solutions on a cash basis. Going forward, the Company will also offer their products also on a PAYG basis
- SunCulture has partnered with Fargo, who delivers its products in Kenya via their 135 drop-off points in Kenya and with a lead-time of 24h



PayGo Energy

- PayGo has developed a **smart metering system with mobile integration for the distribution of LPG** to BOP residential customers for clean cooking.
- Improved service system and innovative smart metering technology that eliminates upfront costs and enables customers to access clean-burning LPG on a pay-as-you-go basis

Energy Access Ventures – Portfolio overview

The logo for Solarise Africa, consisting of the words "solarise africa" in a lowercase, blue, sans-serif font.

Solarise Africa

- Solarise Africa provides commercial and industrial (**C&I**) companies with customised **financing solutions** that enable them to take advantage of solar technologies with limited upfront investment and manageable periodical payments.
- Focusing on captive rooftop and ground mounted solar projects ranging from 100kW to 3MW
- Currently active in Kenya, looking to open in South Africa and has plans to expand into East, Southern and West Africa



Port It Global

- Port It Global is a **mobile phone data-driven financial platform** providing behavioral scoring and pay-over-time services to the unbanked at the point of sale (PoS)
- Business-to-Business-to-Consumer (B2B2C) model, enabling credit poor individuals to build a repayment history and to gain access to low-margin, short-term PoS installment management



Zonful Energy

- Zonful Energy is a provider of clean energy solutions, especially **PAYG Solar Home Systems**, to off-grid households
- Became the country leader in Zimbabwe, and currently expands in the Region



Training & Entrepreneurship

Provide underprivileged people with the knowledge and skills that have long-term impacts.



Our training & Entrepreneurship offer

Build a career path in an energy related job

Adapted to local needs

- Free and accessible
- A few months of basic training
- Or full-time or evening and week-end courses
- Or multi-year training leading to qualifications

Transfer of competencies

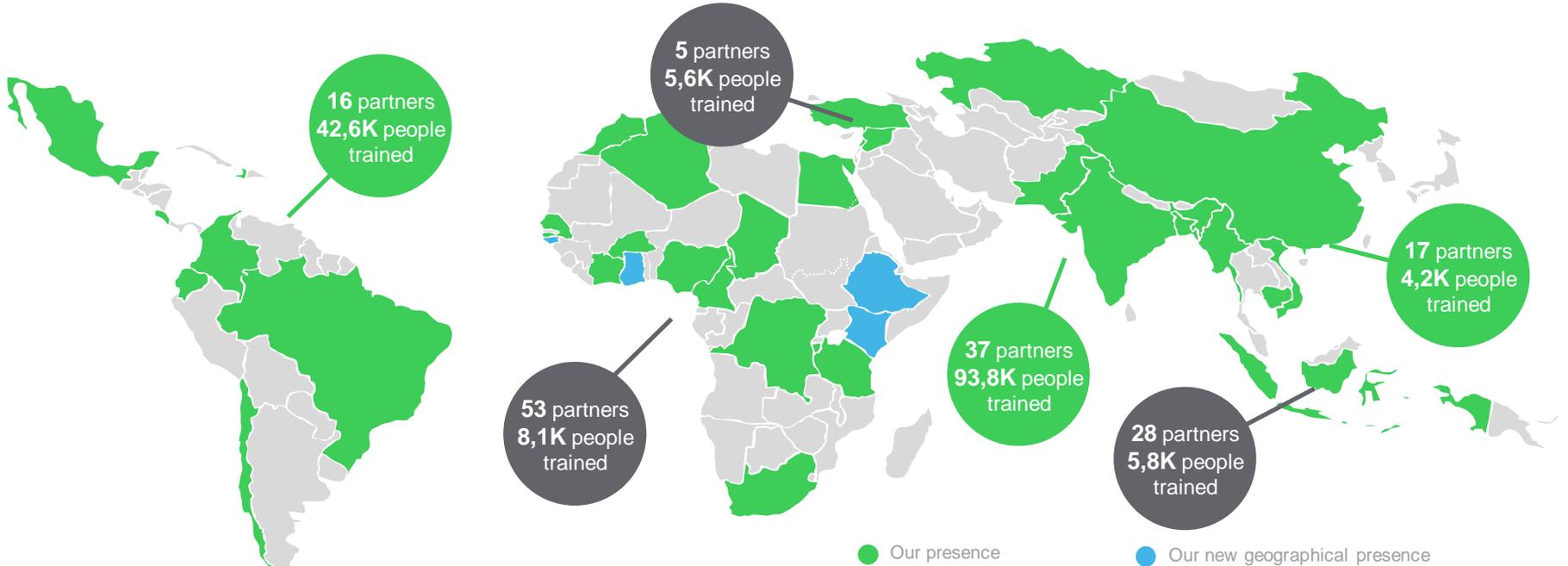
Facilitate the training of trainers to support effective and quality roll-out of training to a wider audience

Empowerment of people

- Enable entrepreneurship for people who have been trained, connecting them with the retail plans of the countries.
- Give trainees the ability, should they wish, to sell and maintain energy access offerings and to create their own small business.

The program worldwide

190,000+ people trained in energy trades, across 150+ projects in 40+ countries with 250+ partners
(local NGO's, local authorities, national ministries of education...)



Our objectives for 2025

Inclusive Training & Entrepreneurship

1,000,000
people trained

10,000
entrepreneurs

#PoweringJobs Advocacy Campaign

Led by **POWER_{FOR}ALL**

How to close the skill gap in decentralized renewable energy (DRE) sector?

- **Up to 20,000 decentralized renewable energy companies**

are needed to ensure access to affordable, reliable, sustainable and modern energy for all by 2030.

- **4.5 million jobs globally by 2030**

could be created by decentralized renewable energy value chain – including sales, installation, service, appliances.

- **Today there is a paradox:**

The majority of renewable energy jobs are in mature countries (less than 1% in Africa).

There is a dearth of workforce with the technical, financial and managerial skills in low energy access countries.

#PoweringJobs

10.3 MILLION JOBS
76,000 JOBS

WORLDWIDE RENEWABLE ENERGY JOBS TODAY
RENEWABLE ENERGY JOBS IN AFRICA

Source: IRENA

Electrifying 1 billion people can create millions of jobs if the proper workforce is developed.

The #PoweringJobs campaign will strengthen the data linking SDG7 to SDG8, and mobilize the resources needed to close the skills gap and ensure we achieve power for all by 2030.

powerforall.org/poweringjobs **POWER FOR ALL**

#PoweringJobs Advocacy Campaign led by



A Power for All branded campaign

Objective:

Promote job creation opportunities in the energy access sector thanks to training and education.



Access to Energy = Access to Jobs

Steps:

1 Awareness: Prove that DRE markets can be created and grown with a positive social impact on energy access, employment (and related SDGs).

2 Advocacy: Grow support within target institutions for financial, policy and programmatic support for DRE training and education.

3 Activation: Demonstrate new opportunities for youth and women (connect the skills set need for DRE to energy sector more broadly).

1 Awareness: prove Decentralized Renewable Energy = positive social impact on energy access and employment

- **Design & conduct first Decentralized Renewable Energy job survey:**
 - In **Kenya, Nigeria, and India:** ~150 companies in each country
 - Including baseline for sector, job creation potential, and training.
- **Conduct a gap analysis** between current trajectories v. actual numbers needed to ensure access to affordable, reliable, sustainable and modern energy for all by 2030
- **Identify reforms needed in Technical and Vocational Education and Training** in low energy access countries and ministries/agencies needed to create transformation (global and national).
- Develop **thought leadership platform** and campaign plan to pursue reforms

2 Advocacy: grow support within target institutions for financial, policy and programmatic support for DRE training and education with a coalition of partners

Global Steering Committees

Local Steering Committees

Campaign partners

Supporters

Kenya

Nigeria

India





Offers and Success stories

Solutions for village electrification and domestic solutions for energy-related needs





Our offer

We develop products and solutions that meet a wide range of both individual and community needs across the energy chain.

- For homes and micro-businesses
- For fundamental public services: education, healthcare,...
- For Micro-entreprises: agriculture, services
- For villages and communities
- For emergencies
- For energy skill development

Our Access to Energy portfolio of Products and Solutions

Individual lighting & phone charging



Mobiya

- Access to light, and phone charging

Individual electrification



Homaya

- Access to light, fans, TV,....

Collective Solutions



Villaya

- Electricity for schools, health center, and other public buildings
- Battery charging
- Lights for public areas & roads
- Easier access to water

Education



Training

- Didactical benches, courses contents

New products and solutions launch in 2018-2019



Life Is On

Schneider Electric

MOBIYA

Portable solutions: solar lanterns including or not a solar panel and a USB port to charge mobile phones

MOBIYA range

Portable solutions: solar lanterns including or not a solar panel and a USB port to charge mobile phones



Mobiya

Solar powered portable LED Lamp with mobile charger
#Mobiya

NEW – Q3 2019



Mobiya Lite

Solar LED Lamp with mobile charger
#MobiyaLite



Mobiya Read

Solar reading lamp
#MobiyaRead



Mobiya Front

Frontal lamp
#MobiyaFront

Mobiya

Portable solar LED lighting system



Best quality & multiples usages



Mobiya Portable Grid Lighting
Grid covered portable LED Lamps with mobile charger



Mobiya TS170 S
Portable LED lighting systems with solar panel



Mobiya TS170 L
Portable LED lighting systems without solar panel

KEY FEATURES



Water resistant

Up to 0.5m depth for one hour



Up to 48 hours of autonomy with one day of charge



Integrated Mobile phone charger

USB Cable with 4 adapters, charge all kind of phones



Shock Resistant

User Friendly - Plug & Play product



Energy Efficient Lighting

Thanks to electronic design, LED technology & Lithium Ferro Phosphate battery

Life Is On

Schneider
Electric

HOMAYA

Solutions for domestic electrification: solar home systems for rural or peri-urban areas

Homaya range

Solutions for domestic electrification: solar home systems for rural or peri-urban areas



Homaya Family

Solar Home System including a solar panel and lamps

#HomayaFamily



Homaya Hybrid

AC and DC, Solar and Grid Home System

#HomayaHybrid

Find out more about this product [in this video](#)

NEW – Q3 2019



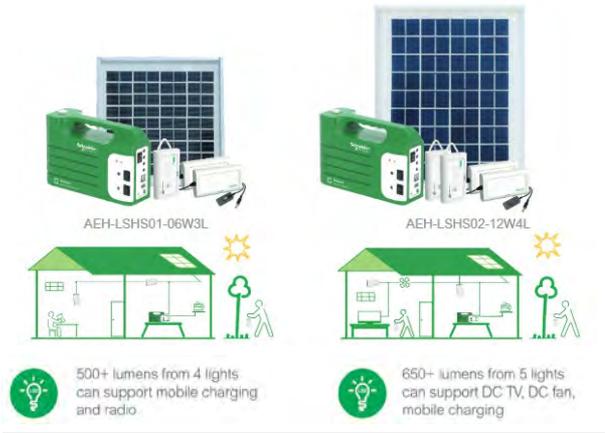
Homaya PayG

Solar Home System Pay as you go, including a solar panel and lamps

#HomayaPayG

Homaya Solar Home System

Individual solar home electrification system



Homaya SHS01
Solar Home System: 500+ lumens from 4 lights supporting mobile charging and radio

Homaya SHS02
Solar Home System: 650+ lumens from 5 lights supporting DC TV, DC fan, mobile charging and radio

KEY FEATURES



Reliable, long life & safe battery

Inbuilt with the latest, clean and green Lithium Ferro Phosphate technology with 5 years battery life



Portable solution

Portable lamps with lithium battery and power box with inbuilt torch



Charges 3 mobiles or a radio at the same time

3 USB charging ports provided to charge standard or smart phones or radio



Additional Solar panel compatibility

Can connect higher Wp Solar panel for quick charging during cloudy days



Globally certified *

Lighting Global, SONCAP, SABS (IEC), LM79, LM80 *

Life Is On

Schneider
Electric

VILLAYA

Solutions for collective electrification: microgrids, solar street lights,
water pumping solution



Focus on Villaya Containerized Microgrids

Focus on Villaya Containerized Microgrids: two product lines

- Villaya Emergency



- Villaya Community



Main market players overview

Access to Energy

Mobile PV panels: **Villaya Emergency**

- Refugee camps
- Disaster relief

Fixed PV panels: **Villaya Community**

- Rural electrification
- Schools
- Small businesses
- Hospitals

Mobile & fixed PV panels

Other segments

- Mining industry and telecoms
- Oil & Gas
- Islands
- Defense



Villaya Emergency

A game changer, containerized technology, including pre-mounted and retractable solar modules



Technical Specifications

Container	10 feet or 20 feet
PV power	From 7kWp to 65kWp (24 to 240 modules)
Power Conversion system	From 7kVA to 63kVA (48V)
Battery storage	From 10 kWh to 120 kWh

Villaya Emergency's advantages

Robust

- Designed by Schneider Electric
- 20 year life span
- Fully tested in house
- Up to 5 years warranty

Cost Effective

- 3 year ROI compared to genset
- No maintenance
- Fast installation

Clean

- Solar energy
- Environmentally friendly batteries specifically designed for high temperature environments

Mobile

- Fast installation: 30min with no expert required
- Transportable by lorry, helicopter (10 feet only) or boat
- Plug & Play

Remote monitoring

- Ecostruxure for energy access
 - Monitoring
 - Control
 - Efficiency

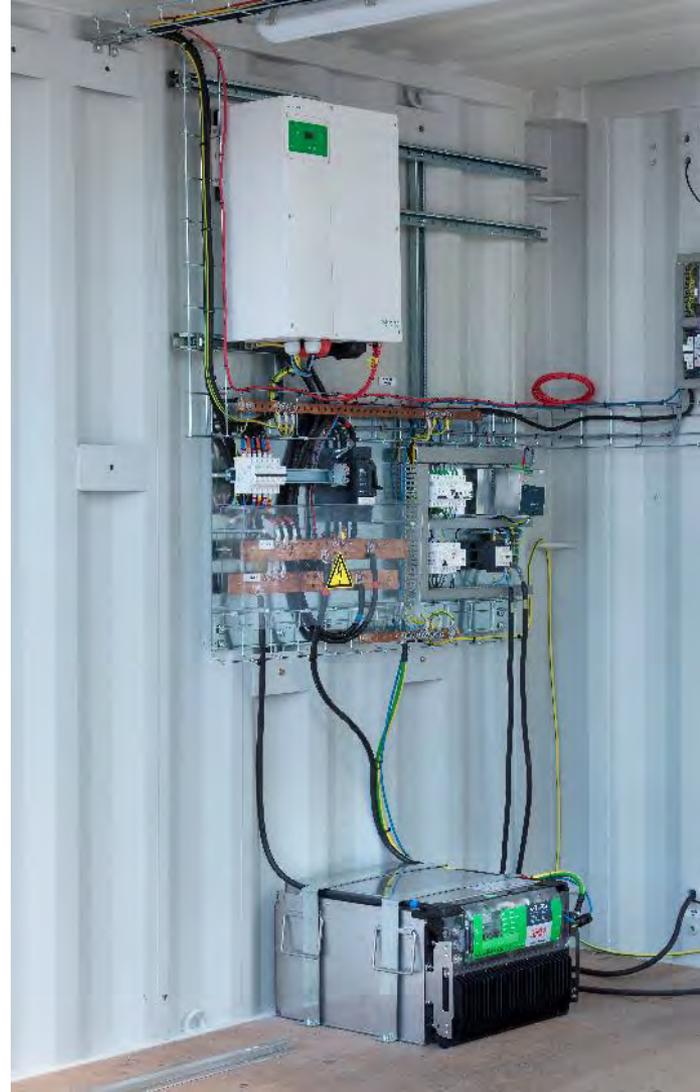
Scalable

- Modular solution
- 10ft or 20ft containers
- Additional containers of PV arrays available
- Hybrid with grid or genset if required

Villaya Emergency

Technological innovations:

1. Sodium batteries, adapted to high temperatures and extreme environments, no need of air cooling systems. 80% DoD (deep of discharge) Environment free and 100% recyclable

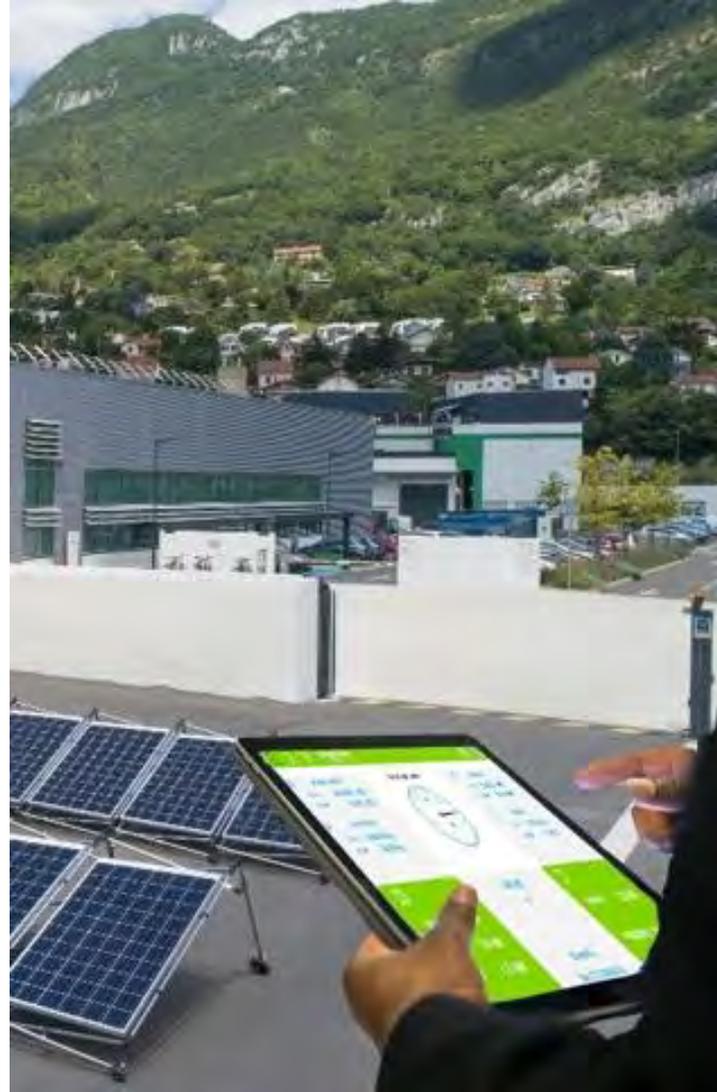


Villaya Emergency

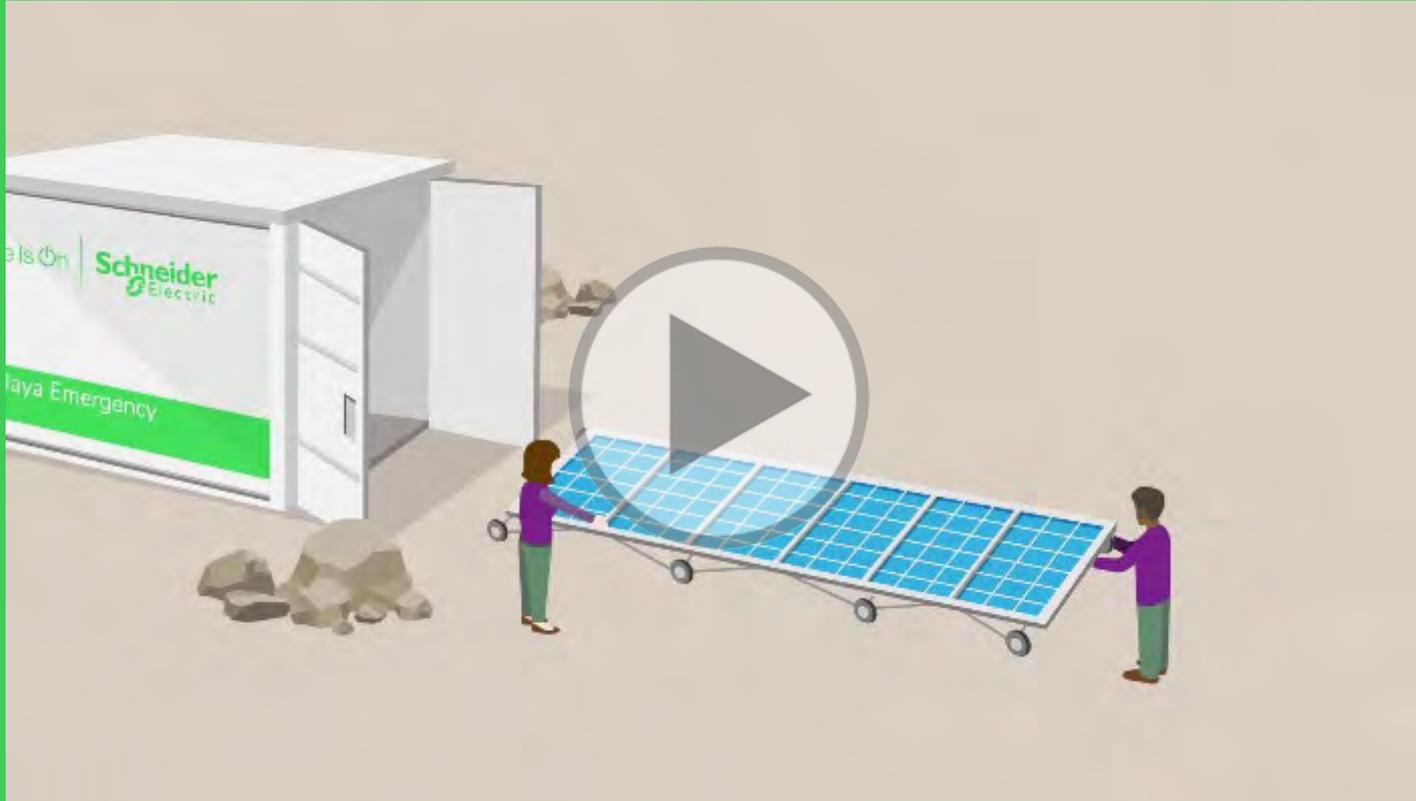
Technological innovations:

3. Remote monitoring

- A system monitor enables users to check **battery status**, along with energy production and consumption levels, at any time.
- **The data can be captured and sent by GSM, 4G or satellite**, and analyzed thanks to EcoStruxure for Energy Access.



Villaya Emergency



https://www.youtube.com/watch?v=4_xgUYjfqWc

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Success stories

UEMOA Countries

Agriculture multi-energy microgrids in 8 countries

Provide “**multi-energy**” plant supplying electricity, hot and very hot water production without CO2 emissions for:

- Fish farming: pool heating for fish growing, refrigerators power supply, fishing food machine
- Rice steaming
- Market gardening: pasteurization, food storage in refrigerators, fruit drying
- Irrigation: pumps power supply

Solution:

- Electrical production: 50 kWp PV arrays / 36 kVA
- Thermal production: 50 KW thermic power with CSP or flat panels

2016-2017: two first sites inaugurated in Togo & Senegal

2018 and onward: up to ~100,000 people in 8 sites of UEMOA countries with also drinking water, lighting and internet access provision.



UNHCR / Refugee camps

Distribution of Mobyia

Global Supplier Framework Agreement

- Schneider Electric selected as a preferred supplier for solar lanterns

CHAD

- Equip a camp in Chad with Mobyia solar lanterns in order to give access to the light at night and recharge mobile phones
- **2016:** 20,000 Mobyia solar lanterns

Rohingya Refugee camp BANGLADESH

- **2018:** 36,000 Mobyia solar lanterns delivered within 45 days after receiving order



© UNHCR



Rohingya camp

© UNHCR/Keana Shirai The UN Refugee Agency

Africa - Rural electrification in Donvagne, Ivory Coast

Schneider Electric is committed to providing:

- an efficient and sustainable **energy access solution**
- and the equipment needed to process **agricultural products**

Schneider Electric and IECD:

- will **train women** in the cooperative to help them find sustainable economic opportunities



Asia - Rural electrifications and entrepreneurs' retail shops

HCL Foundation project

- **47 Solar Microgrids**
- 13 commissioned
- Installation work in progress in 7 microgrid sites

Retail shop with trained electricians

- **22 retail outlets** opened by Schneider Electric trained entrepreneur's – India & Myanmar

Cambodia Tender for rural electrification

- Received order for **3000 SHS** in govt. tender

Cambodia



Microgrids



Retail channel

Nigeria

20+ village electrifications

Partnership with **Green Village Electricity (GVE)**

Schneider Electric as **Technology Partner**,

- Provides support to design the overall Mini-grid system.
- 24 - 38 kWp solar Microgrids installed combining:
 - Conext XW+ power conversion package with remote monitoring
 - A pay-as-you-go prepaid metering solution

Uninterrupted renewable power supply to:

- 200 to 300 households per villages
- 25 small to medium scale enterprises per villages
- Schools, mosques and churches, and public buildings

GVE benefited from a **unique concessional funding scheme** (debt + equity) provided by a commercial bank (Bank of Industry) backed by the UNDP



Our objective for 2025:
50 million people
with access to safe, reliable, efficient and
sustainable energy

JOIN THE COMMUNITY



Access to energy program



@SchneiderA2E



www.linkedin.com/groups/2830580

WANT TO KNOW MORE?

www.schneider-electric.com/en/about-us/sustainability/access-to-energy/



Schneider Electric White Papers

Providing Sustainable Access to Energy:

https://www.schneider-electric.com/en/download/document/998-2095-07-28-15BR0_EN/

Microgrids for Access to Energy:

https://www.schneider-electric.com/en/download/document/Microgrid_for_Access_to_Energy/

Developing the Skills in Energy for Emerging Economies through TVET

https://www.schneider-electric.com/en/download/document/998-2095-07-12-17A_EN/

Micro and Social Entrepreneurs in the Energy Field:

https://www.schneider-electric.com/en/download/document/9982095_05-30-17A-EN/

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