



RENEWABLE ENERGY SOLUTIONS
FOR THE MEDITERRANEAN



*Ministero degli Affari Esteri
e della Cooperazione Internazionale*



Impatti socio-economici degli impianti rinnovabili: Spunti di riflessione sulle nuove frontiere del solare Off Grid



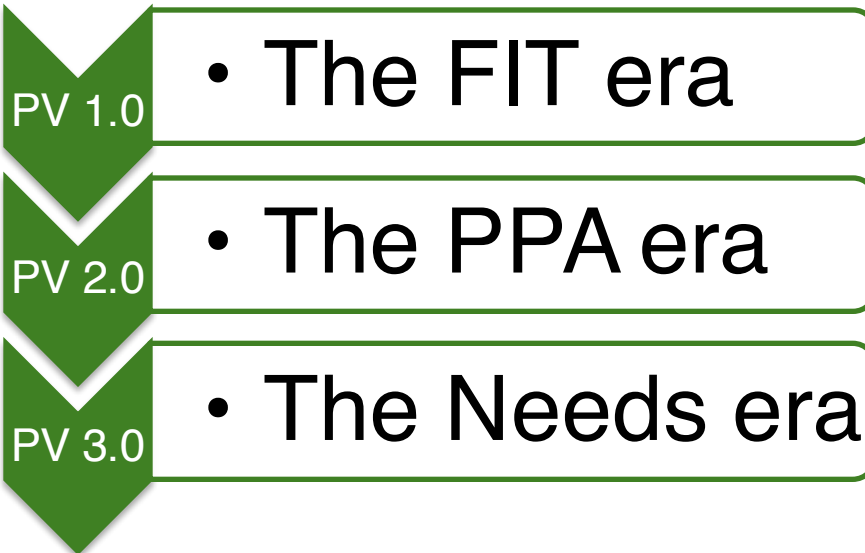
PLUG THE SUN

Luca Piffer
Global Sales Director

Il ruolo delle energie rinnovabili: opportunità di crescita globale ed investimenti nelle economie emergenti

*Ministero degli Affari Esteri e della Cooperazione Internazionale
Roma, 11 maggio 2018*

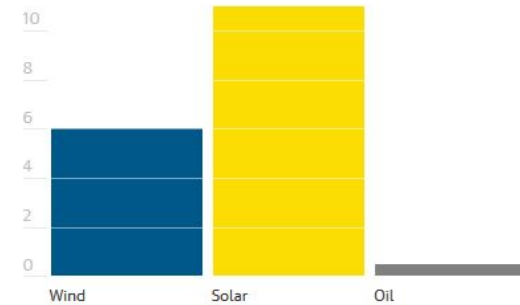
PV 3.0: What's next



Renewables are forecast to fast outpace oil demand growth

Total primary energy demand growth from 2015 to 2035

Annual growth rate (%)



Guardian graphic | Source: Wood Mackenzie

Where are the needs?
In the emerging areas with bad or no grid at all

A few (heavy) statements

The global market for off-grid electricity will be about **\$3.1 billion by 2020** (World Bank)

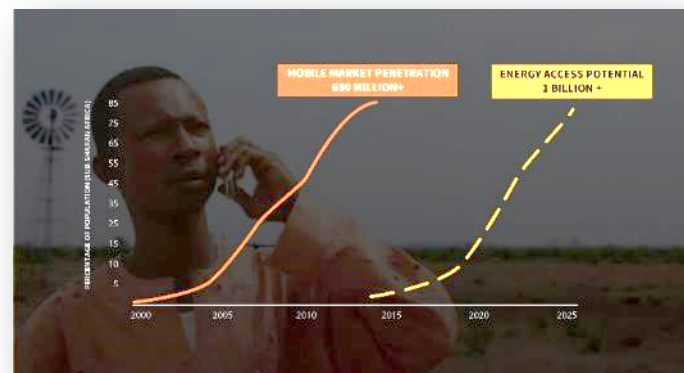
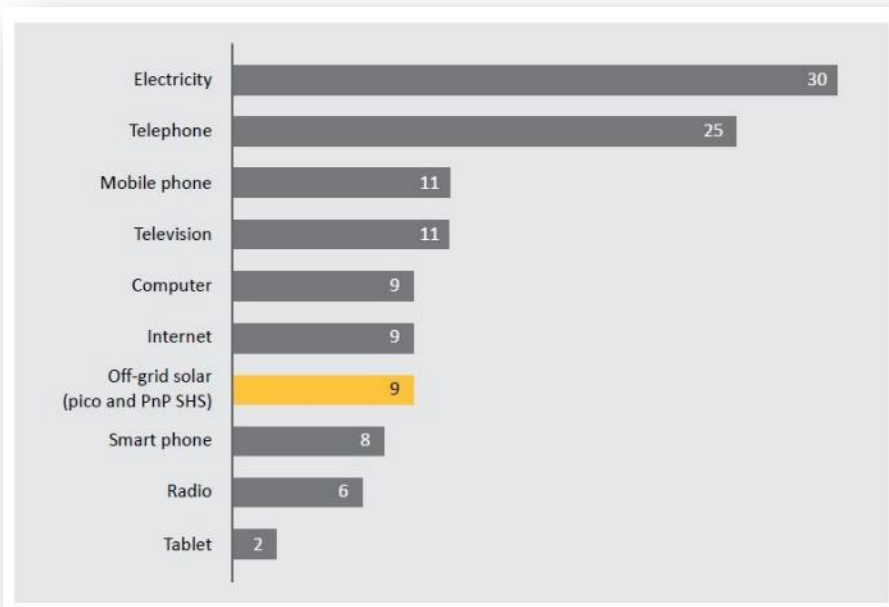
Off-grid electrification and **micro-grids** will become the **most affordable** option in many developing countries (Bloomberg)

The major energy companies would need to spend more than \$350bn on wind and solar power by 2035 (The Guardian)

Over 1 billion people spend about \$27 billion annually on mobile charging and lighting with fossil fuel technologies paying up to 80 times more than people in NY or London (GOGLA).

Off Grid market penetration rate

Time (years) from consumer to 10% penetration for Off Grid applications is as fast as Internet and Computers

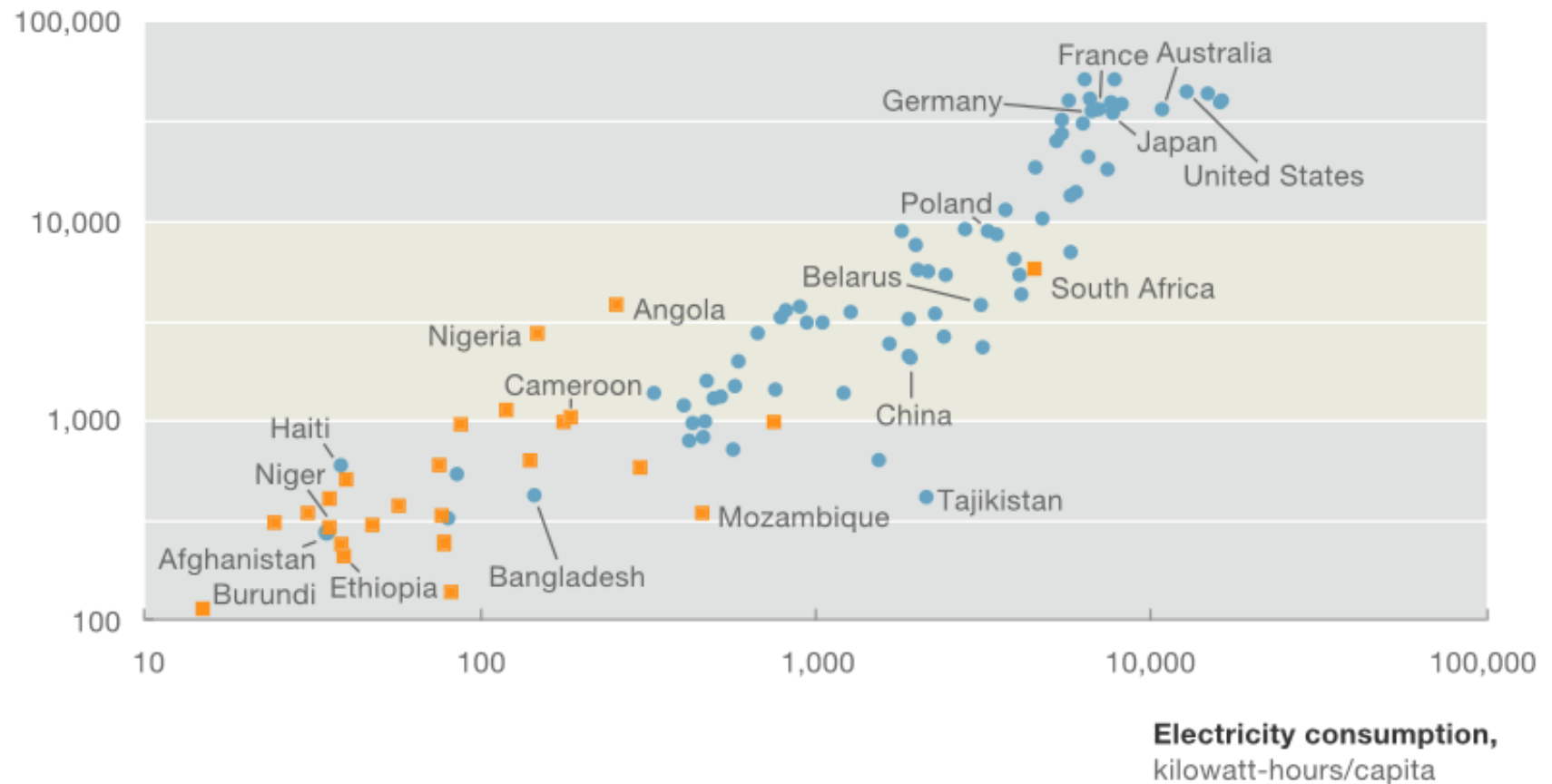


Energy access market likely to replicate the leapfrog made with mobile phones

GDP – Electricity Nexus

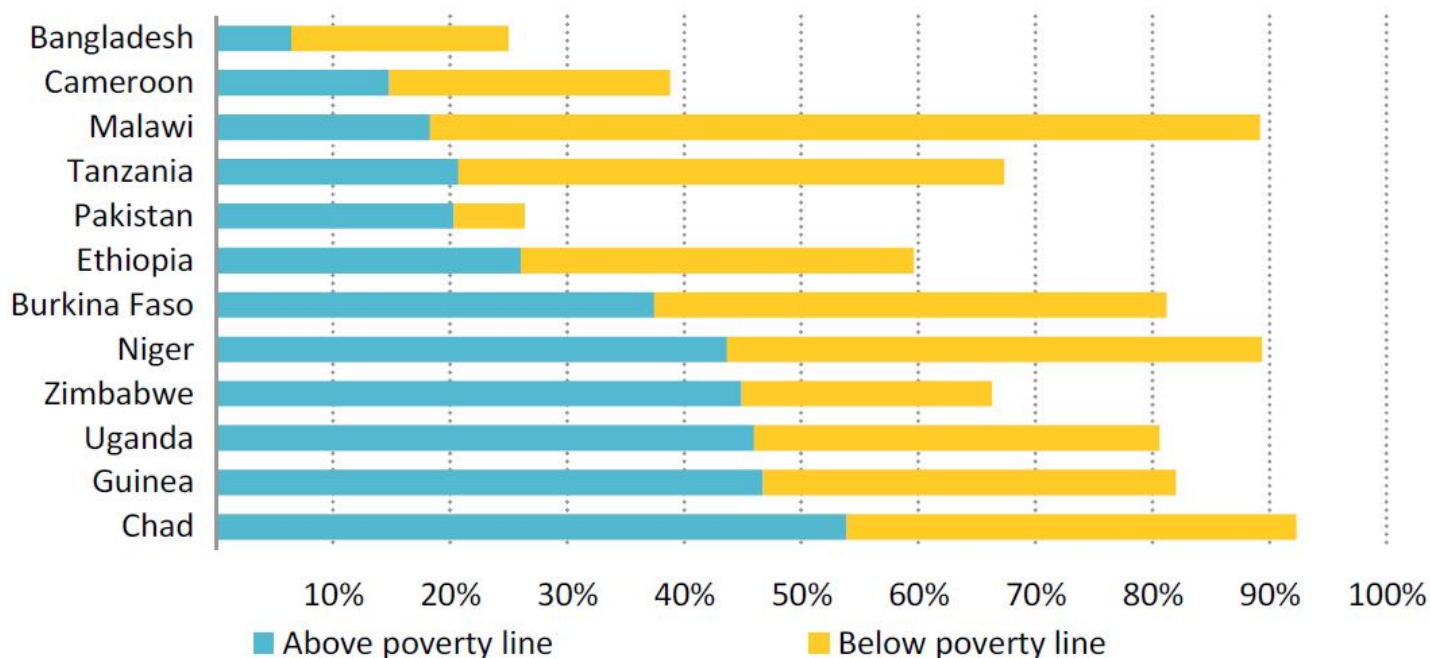
● Other countries ■ Sub-Saharan African countries

GDP,
current \$/capita



Poverty & Electricity

Figure 1.2 ▶ Share of population without electricity access above and below the poverty line in selected countries, 2016



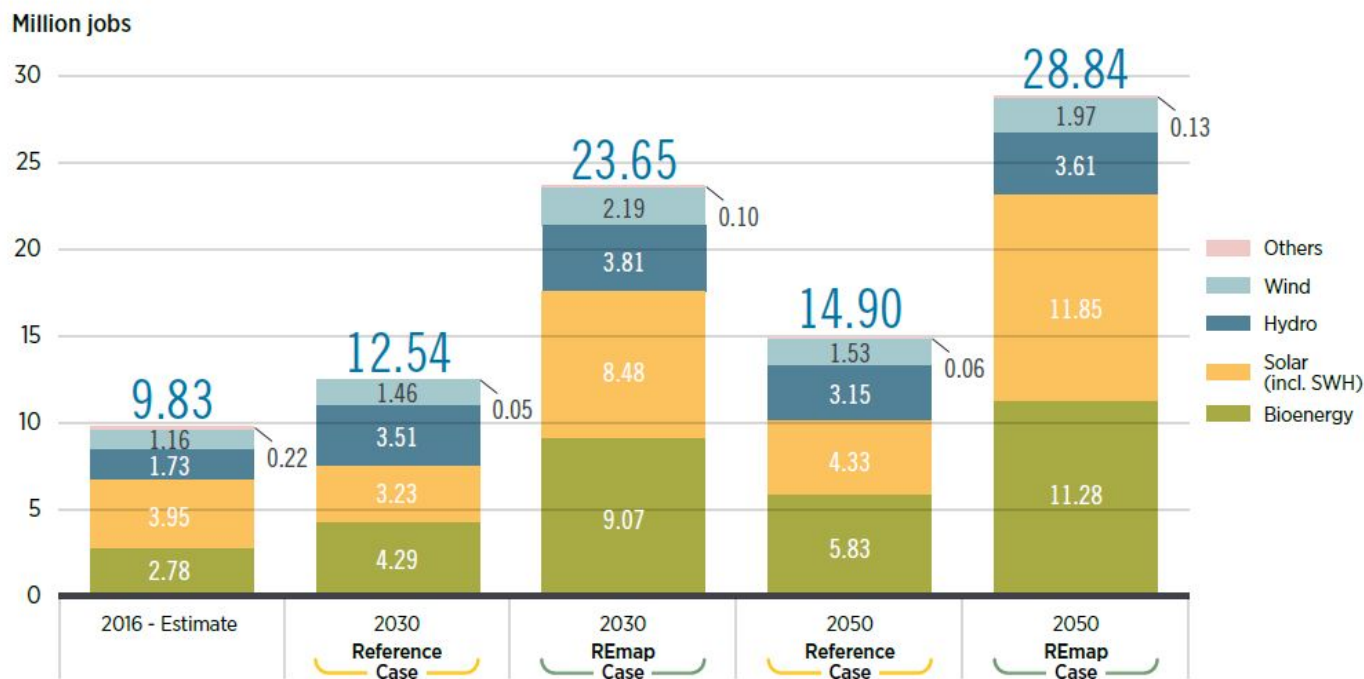
In many countries even those who could conceivably pay for electricity still do not have access due to structural issues

Note: World Bank defines the poverty line at below \$1.90 a day (\$2011 at purchasing power parity).

Sources: World Bank; IEA analysis.

Figure 23. The energy transition would generate 14 million additional jobs in renewable energy by 2050

Renewable energy employment by technology (million jobs)

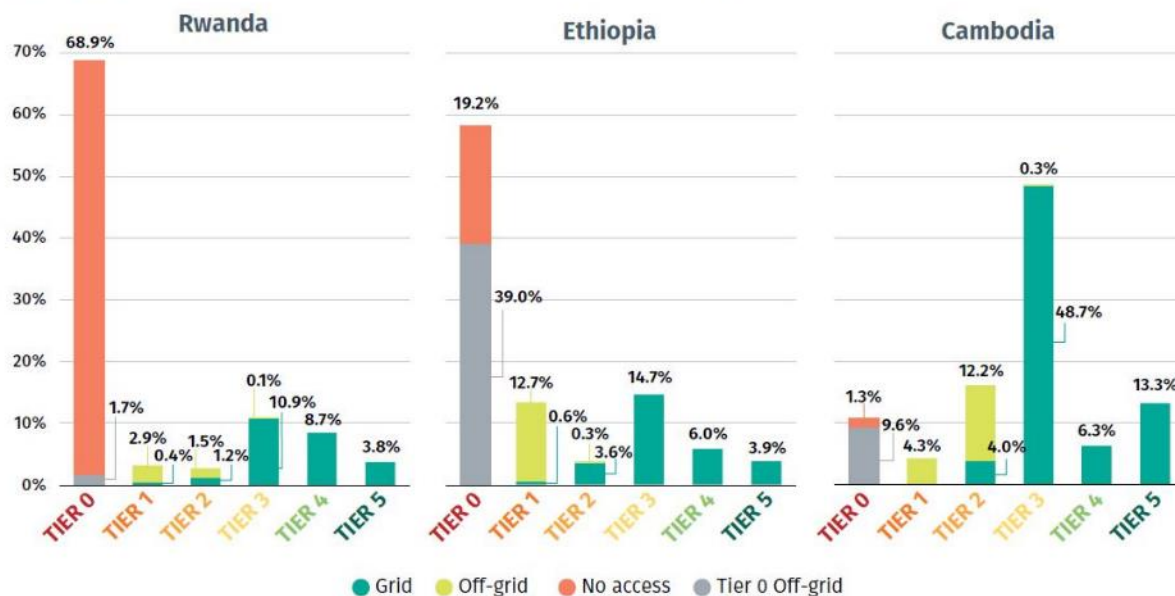


Reference Case. This scenario takes into account the current and planned policies of countries. It includes commitments made in NDCs and other planned targets. It presents a “business-as-usual” perspective, based on governments’ current projections and energy plans.

REmap Case. This analyses the deployment of low-carbon technologies, largely based on renewable energy and energy efficiency, to generate a transformation of the global energy system which for the purpose of this report has the goal of limiting the rise in global temperature to below 2°C above pre-industrial levels by the end of the century (with a 66% probability).

Rural Electrification Trend

FIGURE 2.20 • Multi-Tier Framework: High-level Results of Cambodia, Ethiopia, and Rwanda, 2017



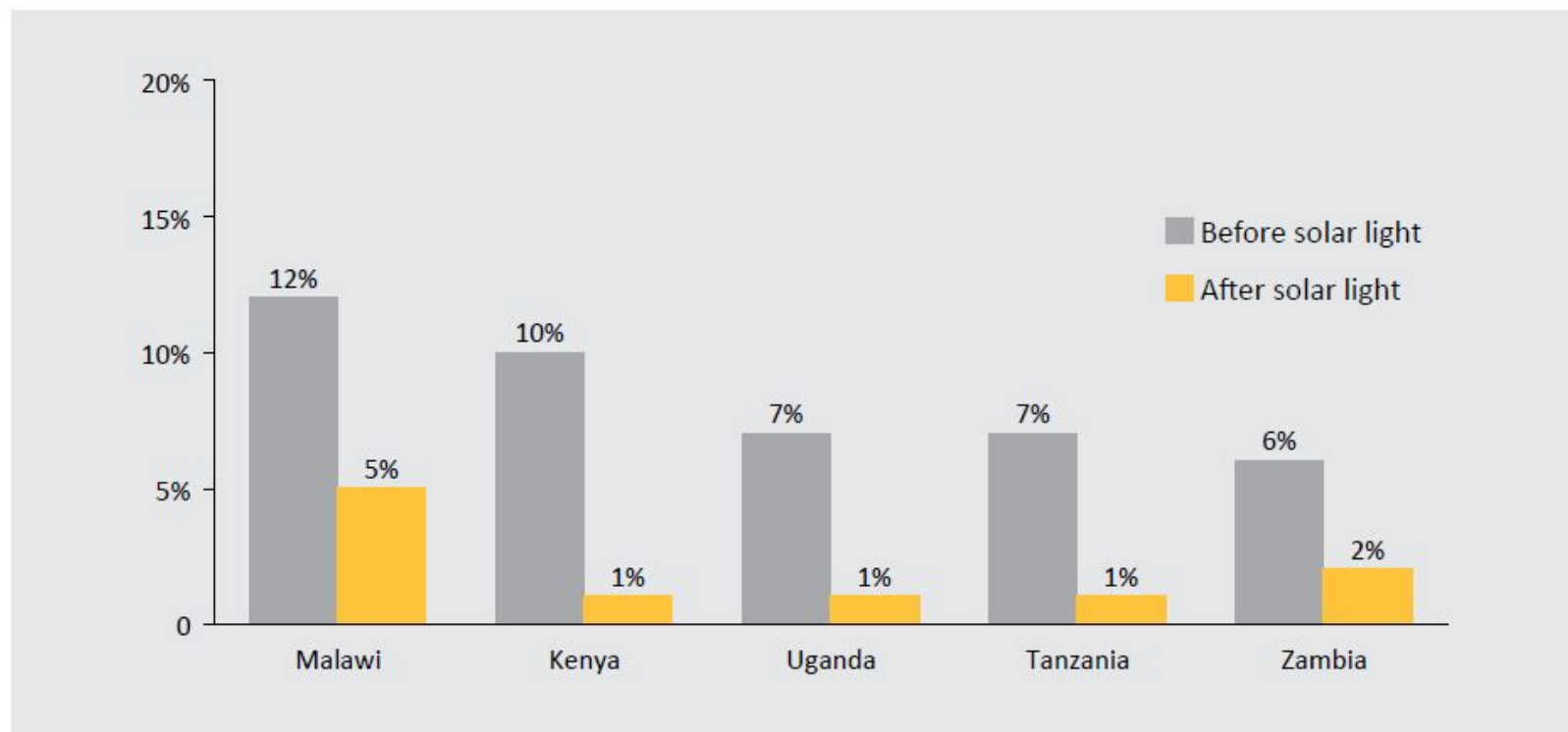
Source: World Bank, MTF 2018 Cambodia, MTF 2018 Ethiopia, MTF 2018 Rwanda.

Figure 7: Multi-tier matrix for access to household electricity supply – Source: World Bank and IEA

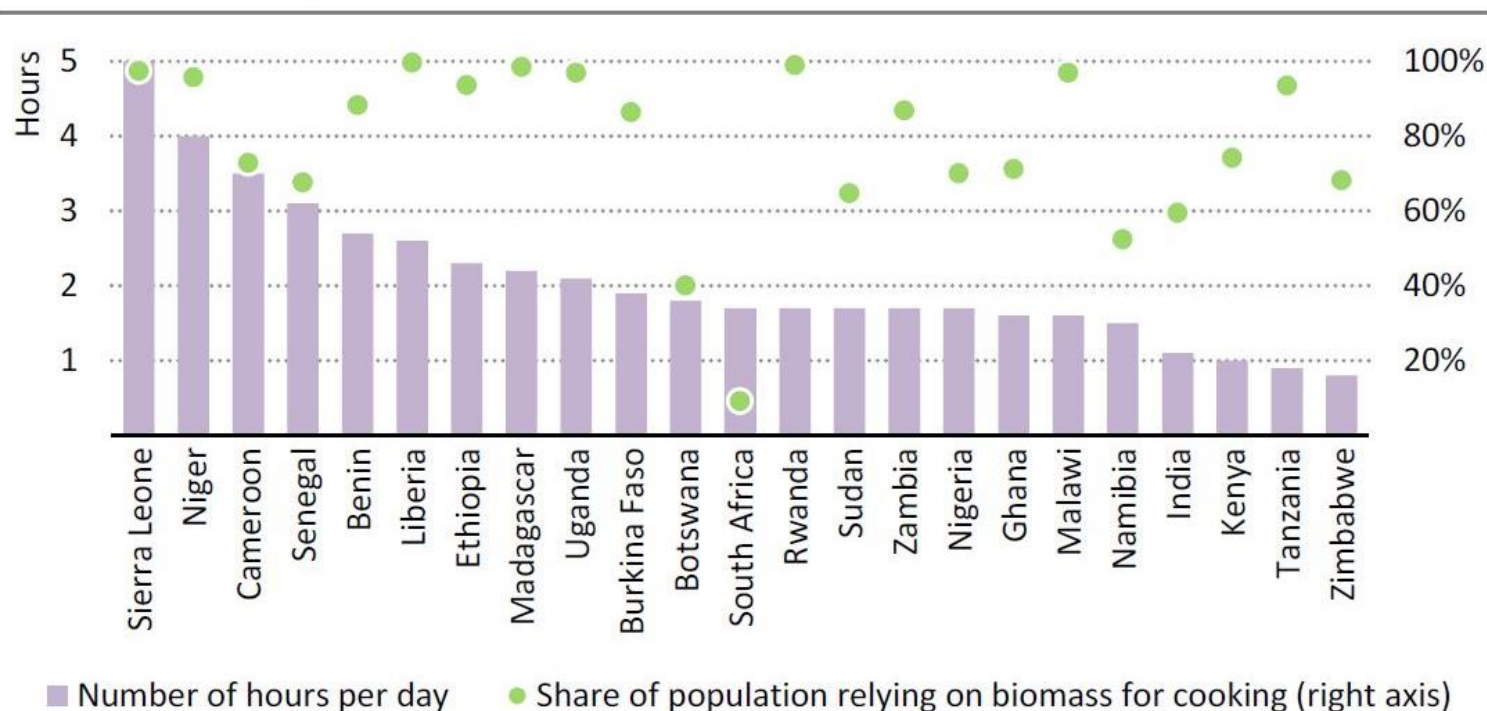
In Euro		Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
1. Capacity	Power		Verry Low Power Min 3 W	Low Power, Min 50 W	Medium Power Min 200 W	High Power 800 W	Very High Power Min 2KW
	AND Daily capacity		Min 12 Wh	Min 200 Wh	Min 1.0 kWh	Min 3.4 kWh	Min 8.2 kWh
	OR Services		Lighting of 1.00 lmhrs per day and phone charging	Electrical lighting, air circulation, television and phone charging			

Figure 101: Proportion of household income spent on lighting³⁷²

Average % of total annual household income; select African countries (2012-15)



Wasted time for fuel collection

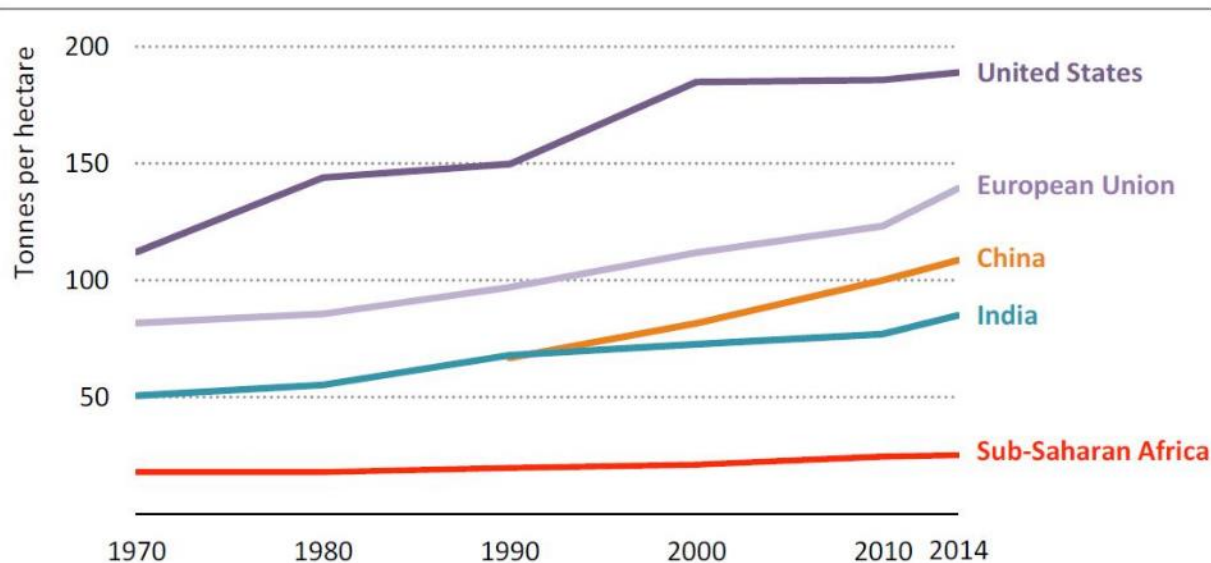


A high reliance on biomass for cooking in many countries means that women and children without clean cooking access spend an average of 1.4 hours/day collecting fuel

Sources: IEA analysis; UNEP, (2017); Practical Action, (2014).

Water & Agriculture needs

Figure 4.17 ▸ Agricultural land productivity in selected countries and regions



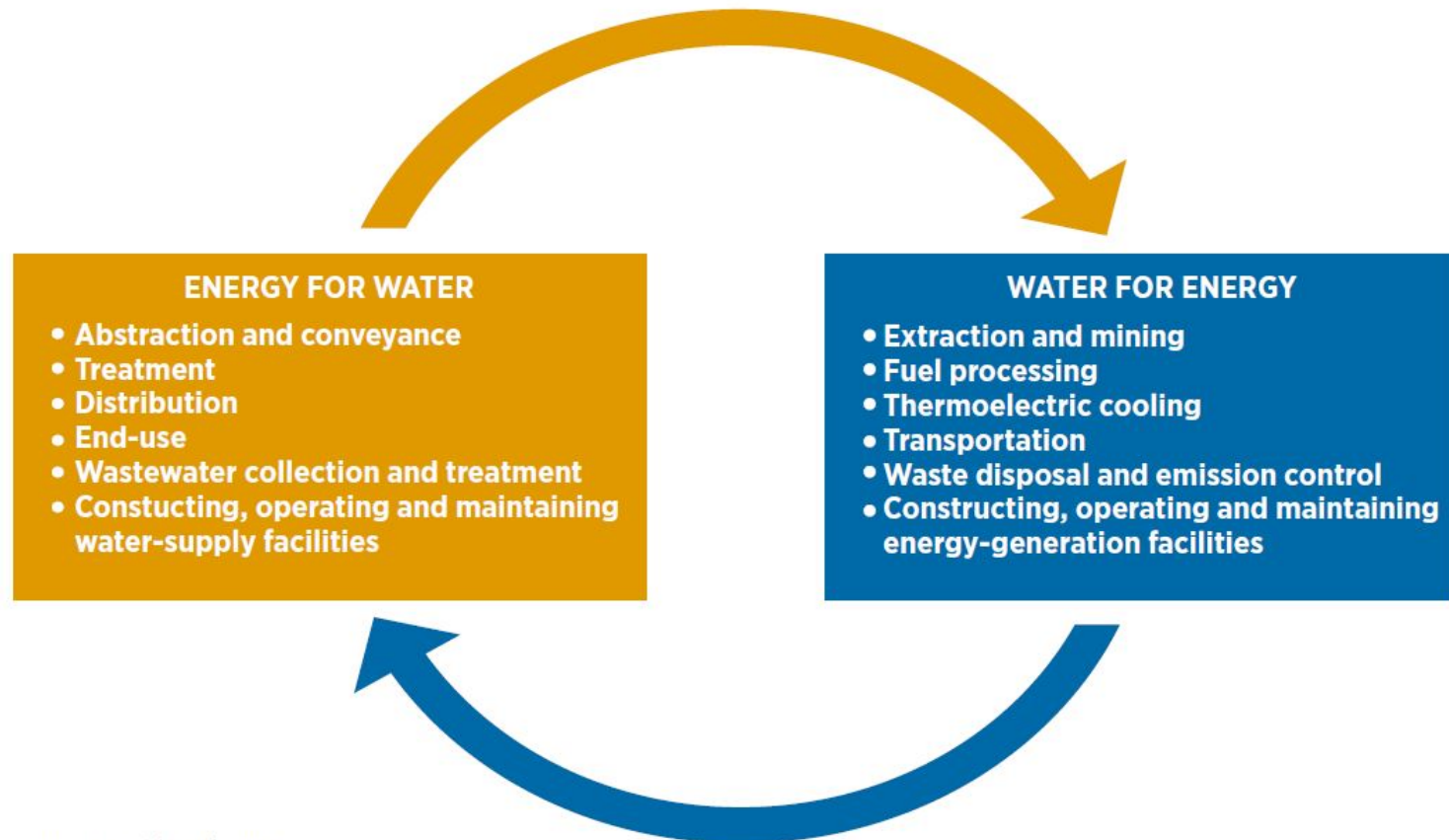
Agricultural productivity in sub-Saharan Africa is well below that of other regions

Note: Data for China are not available before 1990.

Source: FAO (n.d).

By 2030, the share of irrigated areas in sub-Saharan Africa would increase from 4% today to 12%. The combined additional electricity demand for water pumping, full mechanization and post-processing would amount to 12 terawatt-hours (TWh), just 6% more than the total electricity needs to achieve universal access in the Energy for All Case in 2030.

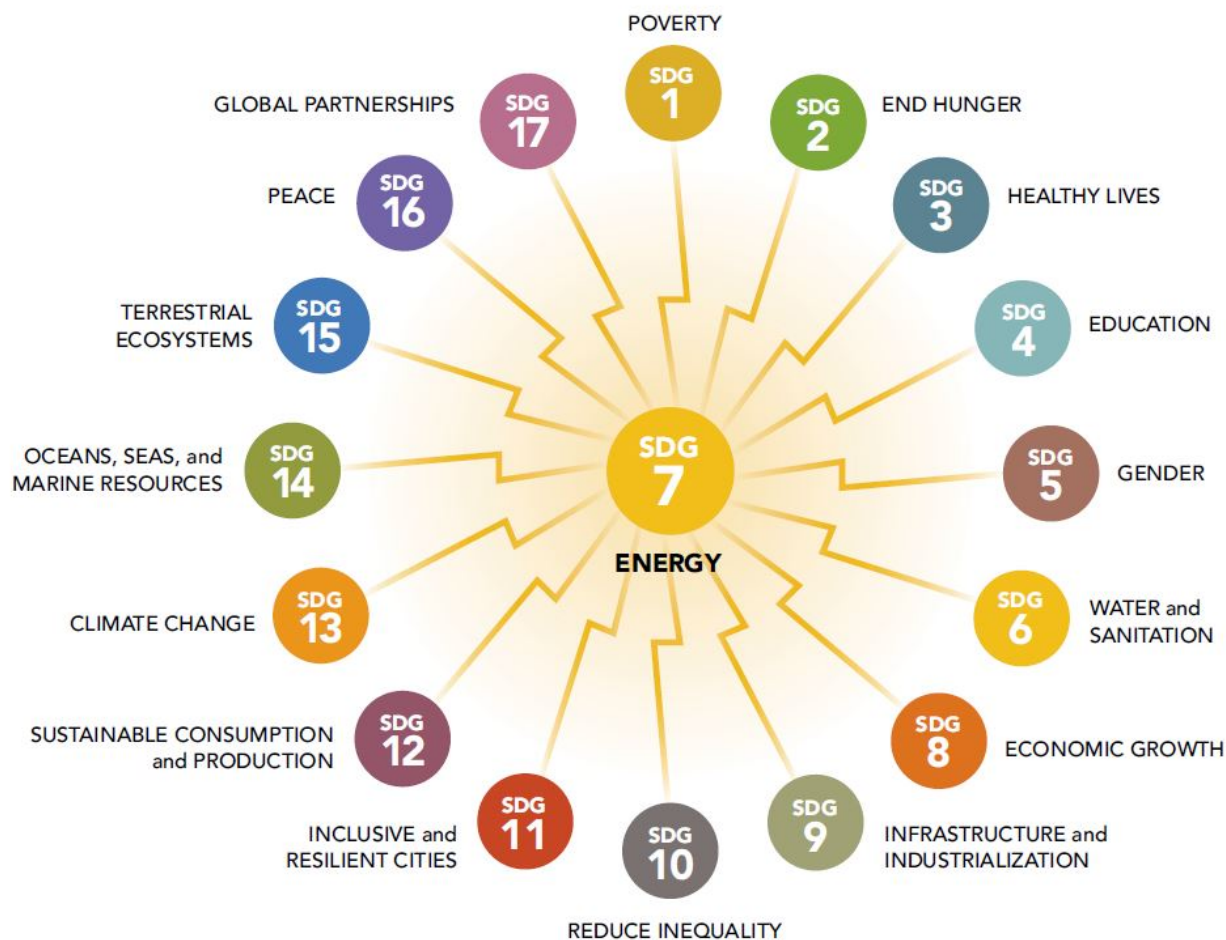
Figure 1.2 Illustration of the water-energy nexus



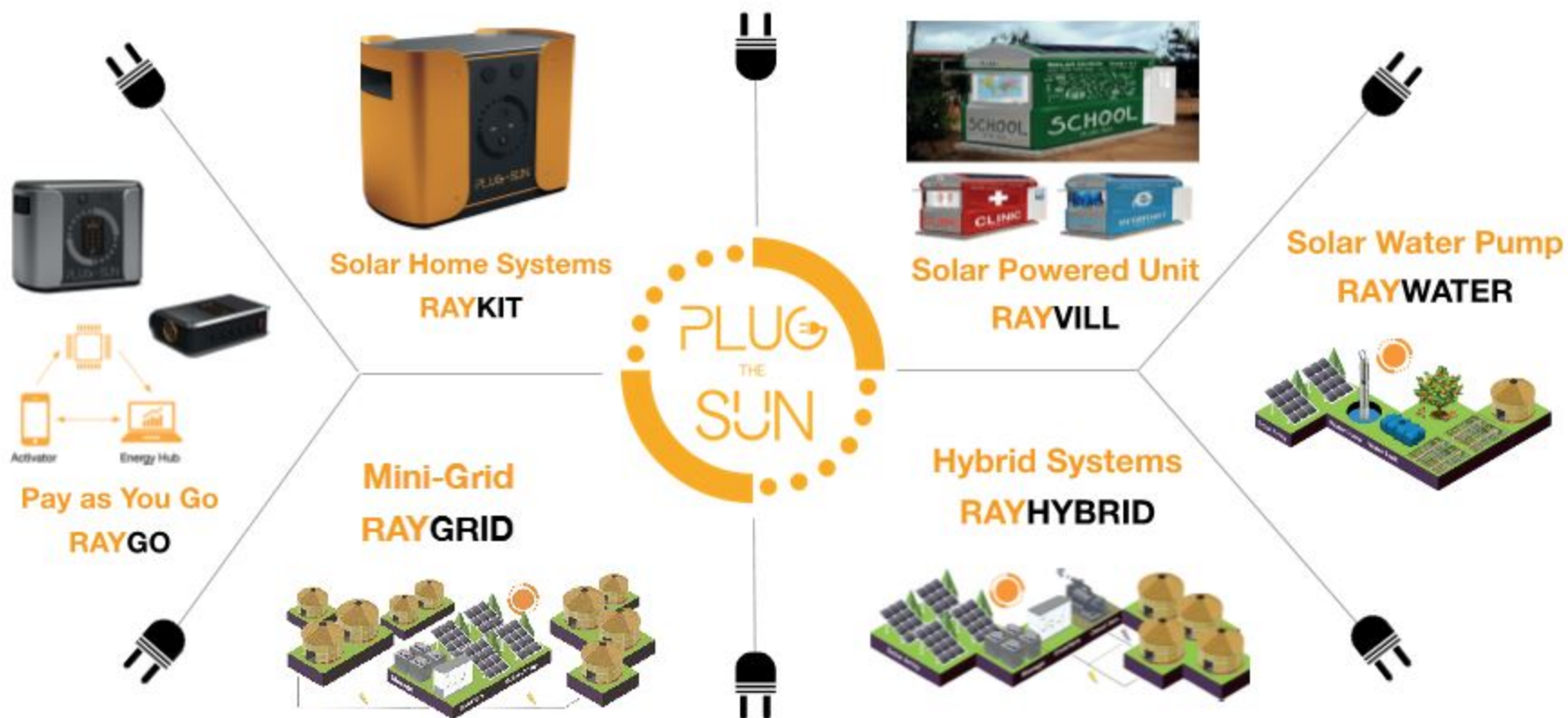
Source: World Bank, 2013

SDG7 – A cross-targets environment

FIGURE O.1 Energy is linked to all the remaining Sustainable Development Goals



Plug the Sun solutions overview



RAYKIT – Our Solar Home Systems

The perfect plug & play solution for
the electrification of houses and
villages



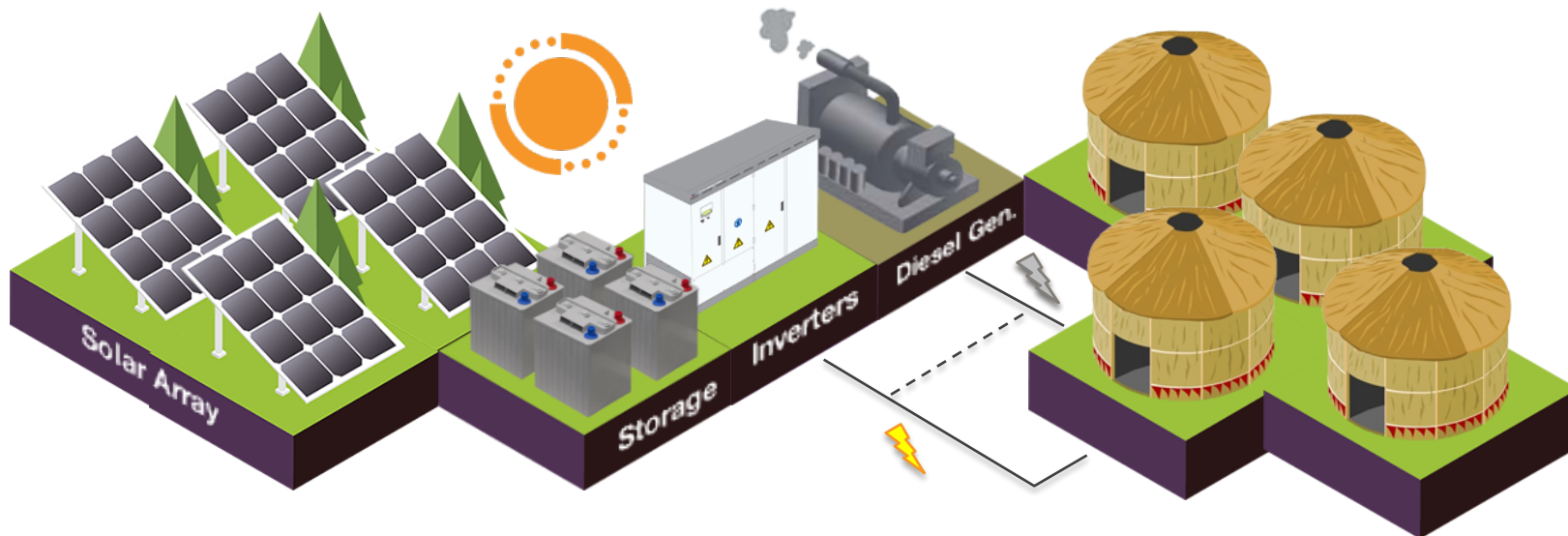
RAYVILL – The solar self-powered unit

RAYVILL is a groundbreaking solar concept that is making a difference in the way people think of solar power and the endless benefits.



RAYHYBRID – The fuel saving solution

RAYHYBRID is a solar system that combines a PV plant with an existing diesel generator, and it is designed to guarantee stability of the power supply and no reliance on fuel prices



Saving

Save up to 70% of fuel cost.

Optimum integration

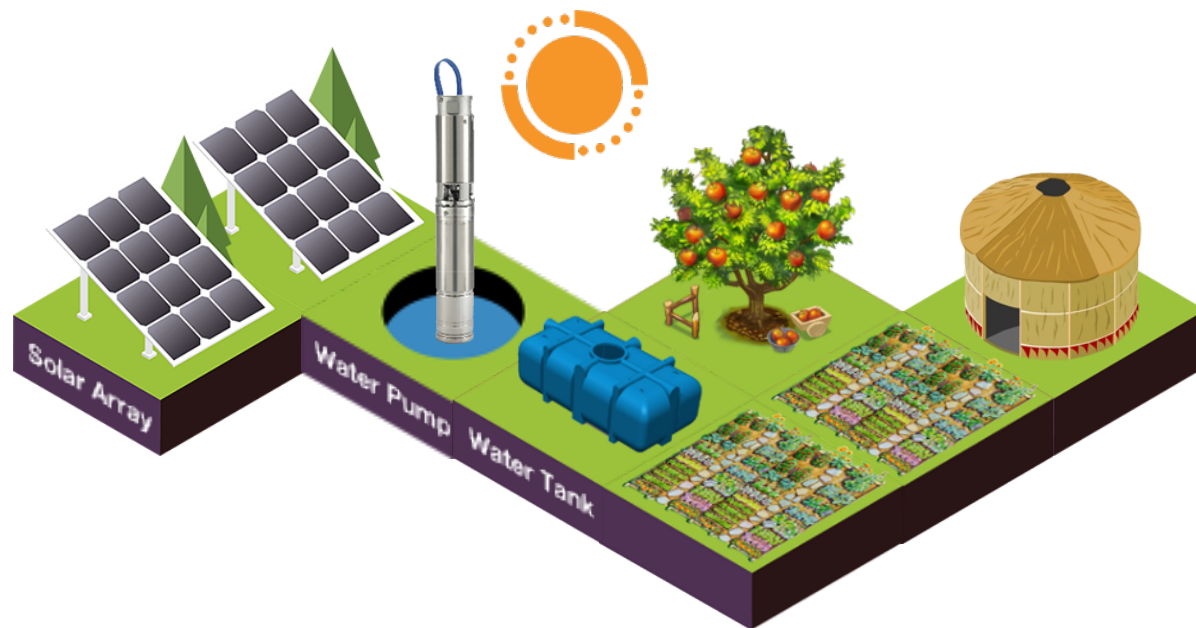
into the existing infrastructure.

Payback

Payback time in 2-3 years

RAYWATER – When the sun brings water

RAYWATER is the Plug the Sun solution for water pumping systems making enjoy reliable water supply with no fuel and very little maintenance.



In partnership with

caprari

pumping power

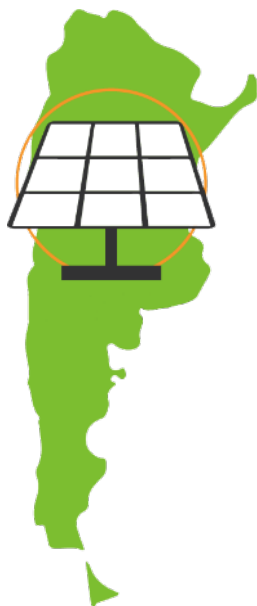
Quick installation

Efficiency

Low maintenance

Our main references

Plug the Sun has been successfully awarded the important Off-Grid tender in Argentina issued by the Argentinian Energy Minister and financed by the World Bank Group.

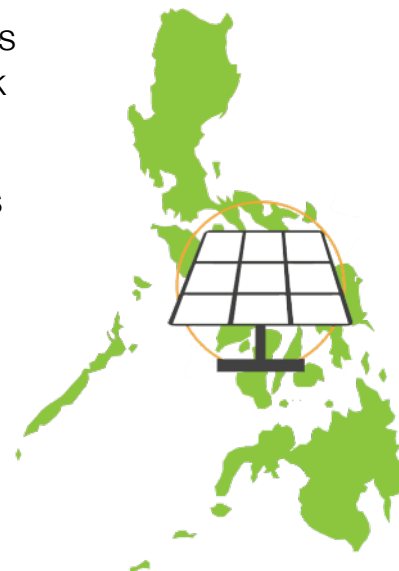


The project includes the supply, installation and maintenance of **8,500 Off Grid SHS** that will be installed across 8 regions covering an area of approximately 2,8 Million of km².



Plug the Sun has been successfully awarded the international “Pay as you go” tender in the Philippines financed by the World Bank Group.

Plug the Sun could win this project thanks to its innovative and affordable **RAYGO** solution. The project foresees the supply, installation and maintenance of **5,000 Off Grid SHS, equipped with Lithium storage technology and remote monitoring software**



The PERMER Project (Argentina) - 1



- **MUNICIPIO: CAUCETE**
- **LOCALITA': LAS TOSCAS**
- **COORDINATA: 32° 3' S, 68° 4' O**
- **DESTINATARIO: EDUARDO ENRIQUE MOLINA**

The PERMER Project (Argentina) - 2



21

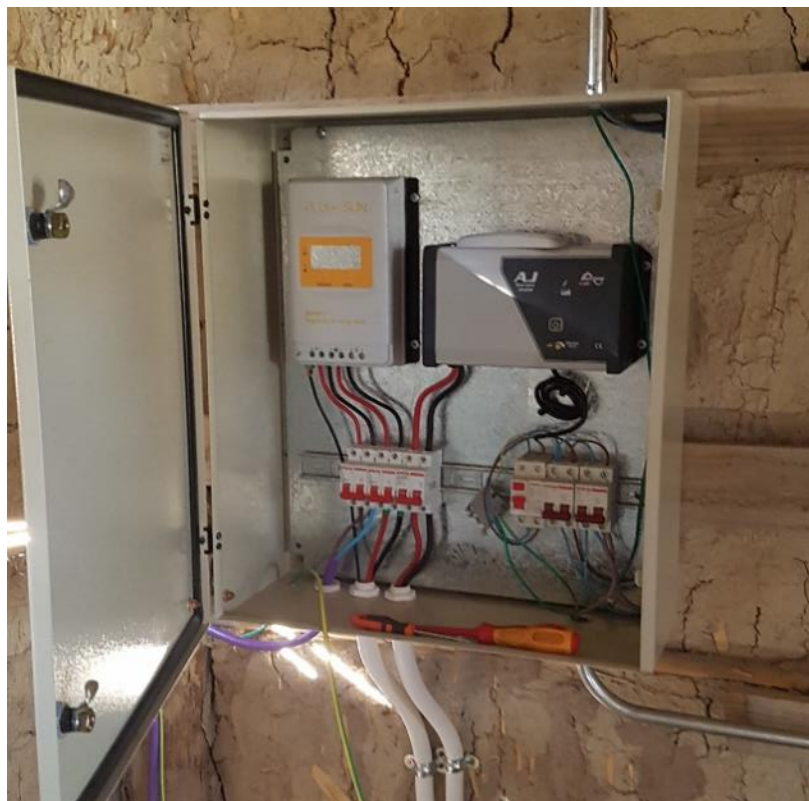
**INSTALLAZIONE PANNELLI E STRUTTURA DI
MONTAGGIO**

The PERMER Project (Argentina) - 3



**INSTALLAZIONE INTERNA LUCI, CANALINE E
INTERRUTTORI**

The PERMER Project (Argentina) - 4



INSTALLAZIONE QUADRO ELETTRICO

The PERMER Project (Argentina) - 5



DETTAGLI INSTALLAZIONE QUADRO ELETTRICO

The PERMER Project (Argentina) - 6



SECI HOLDING

Ingegneria Ambientale
Environmental Engineering

MACCAFERRI

Ingegneria Meccanica
Mechanical Engineering

SAMP

Real Estate e Costruzioni
Real Estate and Construction

SECI
REAL ESTATE

Energia
Energy

SECI
ENERGIA

Alimentare e Agroindustria
Food and Agro-industry

Sadam

Tabacco
Tobacco

MANIFATTURE
SIGARO
TOSCANO

Innovation Hub
Innovation Hub

EJCubE

BIANCHINI INGENIERO
MACCAFERRI **B**

BEKAERT
MACCAFERRI
UNDERGROUND SOLUTIONS

INNOVATION CENTER
MACCAFERRI

/ bmd /
MACCAFERRI

Linear
COMPOSITES
MACCAFERRI

SAMP
SAMPUTENSILI
Cutting Tools

SAMP
SAMPUTENSILI
Machine Tools

SAMP
SAMP SISTEMI

SAMP
SAMP INGRANAGGI

M PROJECT

SAPABA

TUNNELING
MACCAFERRI

arenaria

ENERRAY
Don't worry, be sunny

EXERGY

SEBIGAS

agripower

PowerCrop
Alle radici dell'Energia

SECI
Servizi Agroalimentari

IBARSKE
RIPRODOTTORE

TERMICA COLLEFERRO

Naturalia
First natural vapors

Sadam | Meccanica

Avanti
CIGARI COMPANY

FAB SPACE



Gruppo
Industriale
Maccaferri

GRUPPO MACCAFERRI - HIGHLIGHTS



Gruppo
Industriale
Maccaferri

Tradizione e
tecnologia italiana
dal 1879

Ingegneria Ambientale
Environmental Engineering



Ingegneria Meccanica
Mechanical Engineering

Real Estate e Costruzioni
Real Estate and Construction



Energia
Energy

Alimentare e Agroindustria
Food and Agro-industry



Tabacco
Tobacco

Innovation Hub
Innovation Hub



Stabilimenti: *Factories:*



1.270 million Euro

Fatturato totale
Total turnover

58

Stabilimenti produttivi
Factories

4.747

Dipendenti nel mondo
Employees worldwide

Fatturato per area geografica
Turnover per geographic area

milioni di Euro *million Euro*

Italia <i>Italy</i>	367
Europa <i>Europe</i>	149
Altri continenti <i>Other continents</i>	754



RENEWABLE ENERGY SOLUTIONS
FOR THE MEDITERRANEAN



RENEWABLE ENERGY SOLUTIONS FOR AFRICA

Grazie per l'attenzione



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Gruppo
Industriale
Maccaferri