OFF-GRID EUROPE

Off-Grid Europe’s Journey: Electrifying rural Senegal with Mini-Grids

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OFF-GRID

GENERAL OVERVIEW

OFF-GRID EUROPE FOUNDERS

CHRISTIANE KRAGH

CEO and co-founder

Before founding Off-Grid Europe, Christiane had a successful 12-year career in international marketing and project management.

Under her leadership, the company transformed from Europe's top solar DIY retailer to a renowned provider of energy solutions.

Christiane also serves as Chairman of their subsidiary in Senegal, Off-Grid Africa. Further subsidiaries are in the pipeline.

MARK KRAGH

CTO and co-founder

Mark is the founder and CTO of Off-Grid Europe. He is an expert in renewable energy systems with long-term experience in systems engineering and design, leadership, and data analytics.

Apart from Off-Grid Systems, Mark has developed an innovative solar boat (Sun Sailor) and a containerized solar oxygen solution (Solar O2).

He is currently working on a BESS for commercial use and a solar cooling solution for the agricultural sector (Much Cooler).

OFF-GRID EUROPE HISTORY

2010

Starting the company in the UK

2011

Europe's biggest solar cell retailer

2012

Distribution of solar products

2013

Specialization in Off-Grid systems in Germany

2015

Development of Monitoring & Control software: Off-Grid Controller

2016

Deployment of first Solar Off-Grid system in Nigeria

2018

Project implementation in several countries (e.g. Nigeria, Ghana, Papua-Neuguinea, Paraguay, Mauritania)

2019

Awarding of the rural electrification project ASER300 in Senegal. Electrification of 200 villages.

2020

Foundation of Off-Grid Africa SUARL in Dakar, Senegal

2021

Start of implementation of the rural electrification project ASER300. Continuous EPC and Installation of 200 Solar Off-Grid Systems in Senegal

2022

Development of new products: Solar Home System, Cooling food storage: Much Cooler, Battery Energy Storage Systems (BESS) On- and Off-Grid

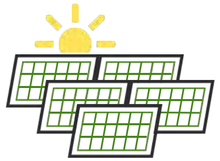
2023

Foundation of Voltares Africa, Strategic partnership to finance energy projects in Africa

END-TO-END TURNKEY SOLUTION

PLANNING

Evaluation of demand, analysis of return of investment, design, finance)



MANUFACTURING & PRODUCTION

Engineering, containerized solutions, electronics, steel mounting structure: Sun Hat

EPC

Engineering, procurement of equipment, construction, fast installation

LOGISTICS

Packing, shipping, distribution

MONITORING & CONTROL

Smart software solution, ensuring maximum lifespan

OPERATION & MAINTENANCE

Operation, maintenance, securing optimal return of investment

TRAINING

Local engineers and electricians, knowledge transfer

PROJECT FINANCE

Financing options available

RESEARCH & DEVELOPMENT

Continuous product iteration and improvement, development of new products

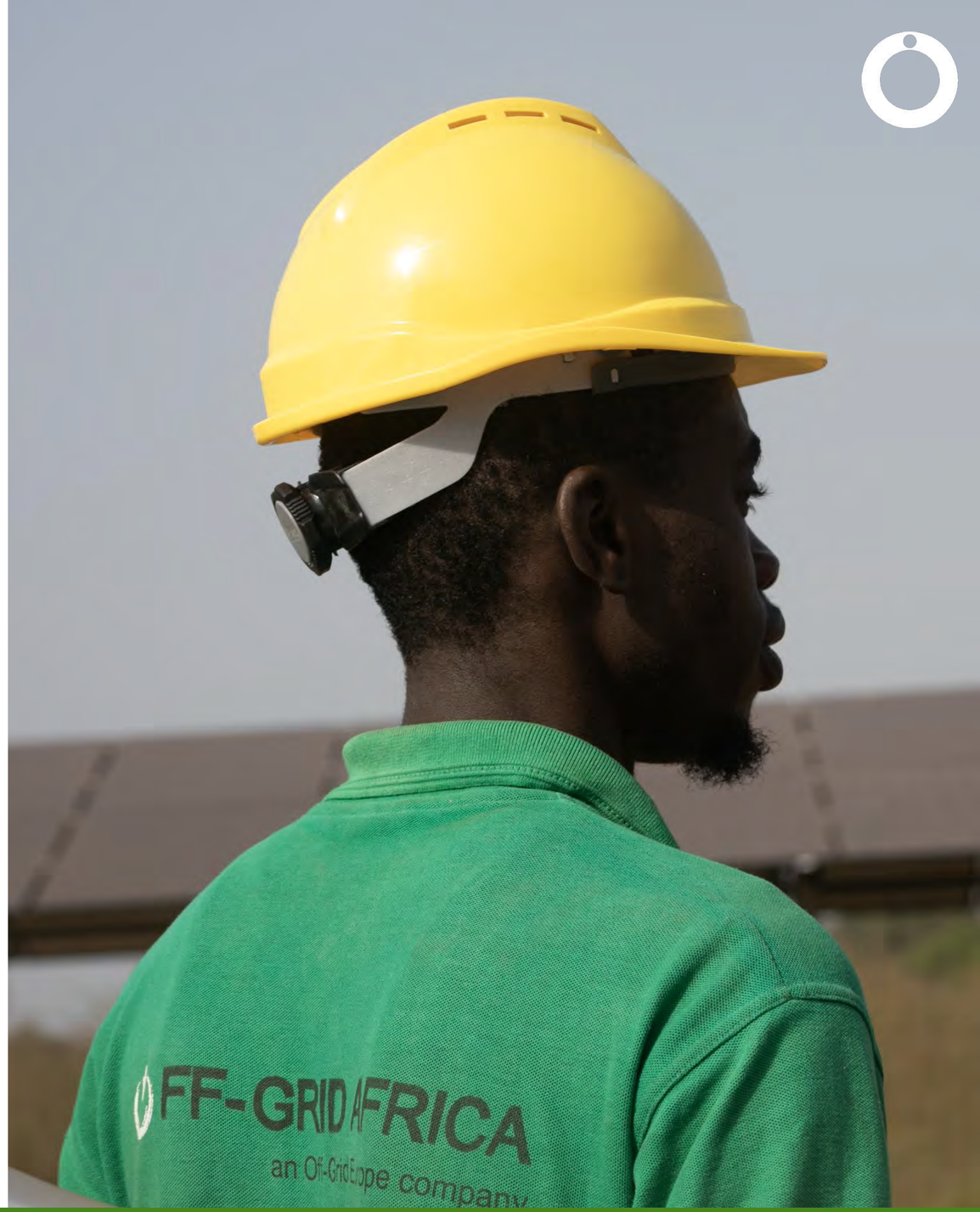
OFF-GRID GROUP

OFF-GRID EUROPE GMBH

- 25 employees
- Engineers, Electrical workers, Logistics, Administration, Marketing & Design, IT Developers etc.
- 16 nationalities

OFF-GRID AFRICA SUARL

- 55 employees
- Engineers, Electrical workers, Administration, Health & Security, Installation Teams, Drivers etc.
- nationalities: mostly Senegalese but also neighbouring countries



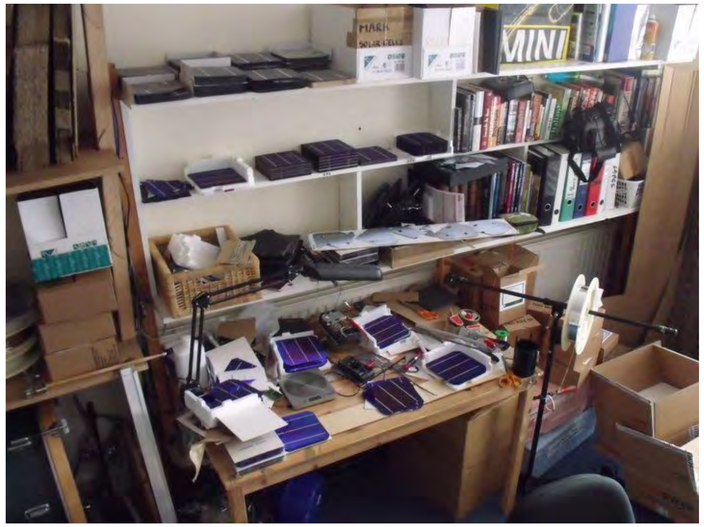
OFF-GRID EUROPE TEAM

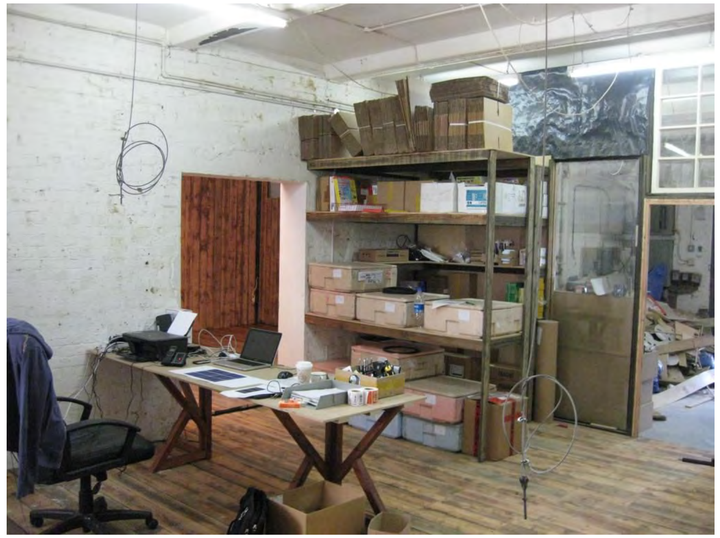
OFF-GRID AFRICA TEAM INSTALLATION

HOW IT STARTED

PICTURE STORY TELLING BY A SUCCESSFUL ENTREPRENEUR

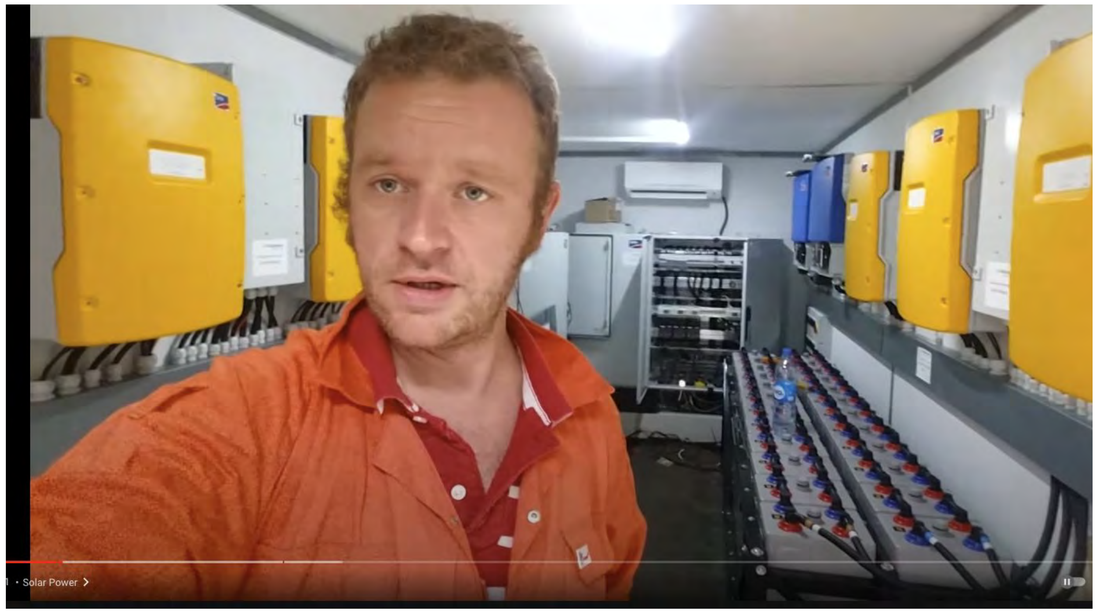
2010-12
Foundation of the company





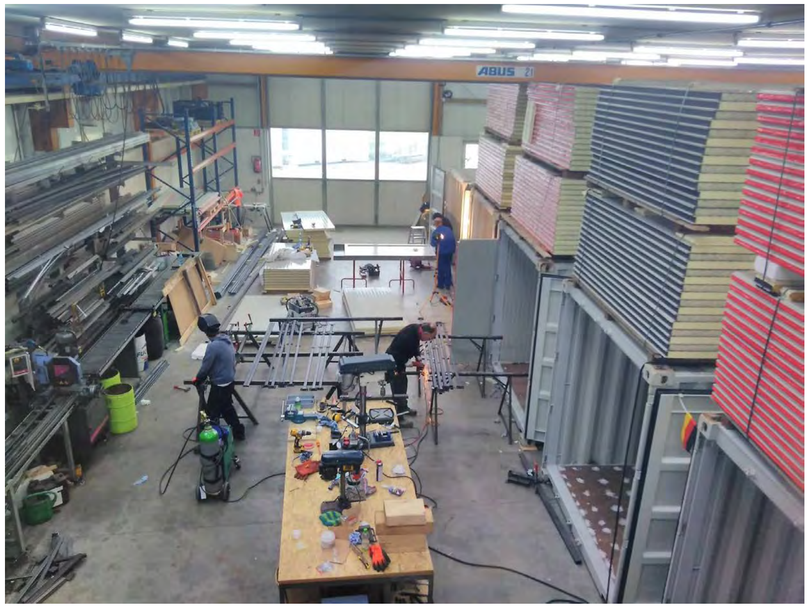
2010-12
Attempting to start charitable solar business

2012-15
Getting into bigger equipment and more valuable projects



2016-18

Project size continues to grow by the year



OFF-GRID EUROPE
REFERENCES 2016-2019

GHANA

Powering a fitness centre.

65 kWp

278 kWh

PAPUA NEW GUINEA

Powering Airport Lighting.

20 kWp

100 kWh

MAURITANIA

2 Off-Grid Systems powering air quality monitoring.

PARAGUAY

Powering a large farm.

100 KWp

156 kWh

NIGERIA

Electrification of 3 hospitals.

0,4 MWp

3 MWh

OFF-GRID EUROPE
REFERENCES 2019-2023

NIGERIA, CAMEROON, GUINEA

Powering of 10 petrol stations.

0,5 MWp 1,2 MWh

SENEGAL

Innovative Cooling food storage for agricultural cooperative (Much cooler).

141 KWp 156 kWh

SENEGAL

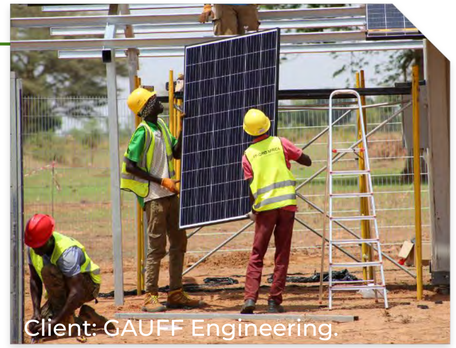
Rural electrification of 150+ villages.
5 MWp / 25 MWh.

5 MWp 25 MWh

SENEGAL

Electrification of training centre.

20 kWp 40 kWh



SENEGAL

Electrification of Goethe Institut in Dakar.

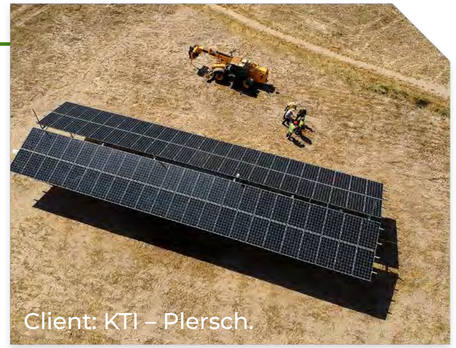
118 kWp 29 kWh

OFF-GRID EUROPE
REFERENCES 2023

SENEGAL

Electrification of Ice factory.

35 kWp 38 kWh


Client: KTI – Plersch.

SENEGAL

Electrification of 22 banana farms with solar water pumps.

0,62 kWp 330 Ha.

ID BIO. Financing: Voltares Africa.

How do you create success?

STEP BY STEP GUIDE OF SUCCESS

WHAT DOES IT MEAN TO BE AN ENTREPRENEUR?

- The day you stop learning and developing is the day you stop being an entrepreneur and become a business owner
- You grow your network
- Have a vision and continue to develop it as you learn more
- You will never be satisfied with your achievements
- There is always more to find around the next corner
- Risk taking is an essential part of the game
- The faster you want to grow, the more risk you must accept
- Work with whatever you got, use your resources creatively
- Beg, steal, borrow is the tried and tested way to survive

DO YOU REALLY KNOW WHAT YOU ARE SELLING?

- Understand if your customer wants what you are selling
- Understand if your customer understands that really they need what you are selling
- Don’t work blindly on your products. Remember, your product will only be successful if it has a real application
- Don’t expect your product to sell, even if it is exactly what the customer needs.
- You are your no1 sales representative

FIND THE RIGHT PEOPLE TO WORK WITH

- One of the hardest parts of setting up a business is finding the right people to work with.
- You have to expect a lot of staff attrition. This might not be your fault, it is simply a mathematical fact that if the average employee probation success is 70-80%, if you hire 20 people, you will have to dismiss 4-6 people within 1-3 month + people who naturally find other work. When you grow, this problem will persist on all levels of management
- You have to trust them with your money and your reputation
- You have to have a VERY clear line in terms of what you require from your people
- If you are new to the game, this is most likely a trial and error process, you can not create a perfect taskforce/group from the beginning
- You have to be present or have people who represent you and your vision at all times, to ensure your company is put together correctly
- You MUST present clear leadership for your company and subsidiaries. Let them know you care

THE USE OF TECHNOLOGY

- Open Source hard and software, with well established communities which are not owned by license claiming corporations is always a good start.
- Incorporate and test hard/software whenever possible to ensure the systems work as required
- Build up in-house R&D teams which have determination, skill and passion in their respective fields. These teams are assets to your sales and project management teams
- Stress test hardware in the worst possible conditions - lab testing is NOT field testing and not a substitute for real life deployment.
- You don't want to be first to implement a new technology
- Use tried and tested solutions whenever possible, especially with hardware as you can not update a piece of code if your impeller is broken.
- 5-10% performance increase is not the main driver in developing markets. What people need are solutions which will work in hot, sandy, humid conditions with poor options for service.

TO SUBCONTRACT OR NOT GENERAL PHILOSOPHY

- Can you create local value/jobs/opportunities/goodwill?
- What are the company/Group goals?
- Is it a one-off project or a ongoing project?
- Will the pain of in-house engineering/building force you to grow? Is it possible and realistic?
- Can you take the pain, do you have the skills and commitment to learn?
- If you do subcontract, do you have the skills to manage your subcontractors? If not you can soon see your money leave your account with no way to get it back.

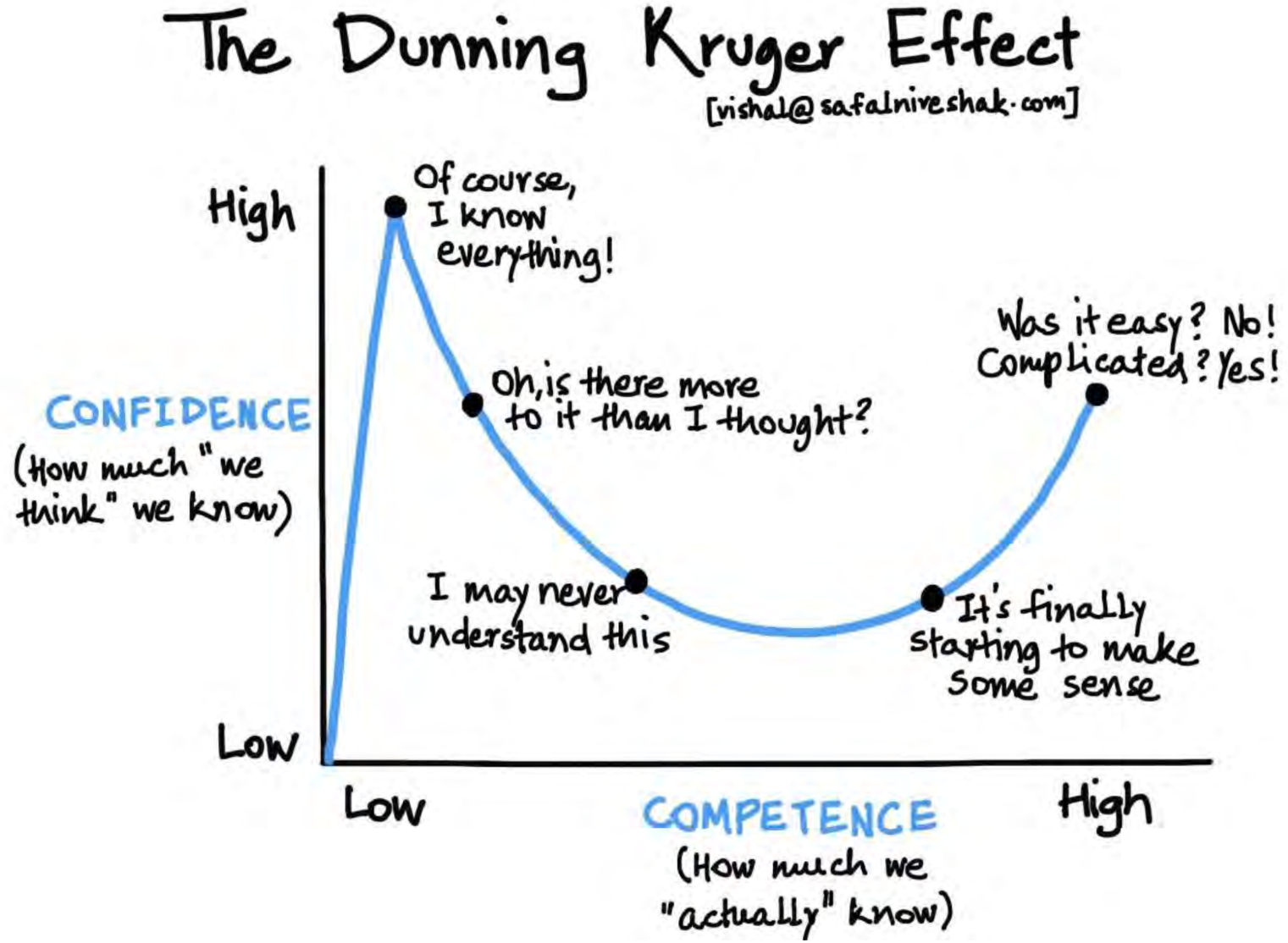
OPTION 1 - HIRE SUBCONTRACTORS

- **Pros:**
  - Often there are already companies in the marketplace, who (may) have a track record of deployments. These companies can be subcontracted to gain fast access to the market
  - Contractors have the required local knowledge, contacts, sources, skills and experience and will make less mistakes (this is the idea)
- **Cons**:
  - The subcontractor is gaining valuable IP and knowledge which your company could use
  - When you pay a subcontractor you could be paying/creating a future competitor
  - Iteration feedback to product development is difficult because the subcontractor has no incentive to share lessons
  - Changes, updates to designs/methods can be subject to re-negotiation of contract and maybe not a priority of the subcontractor, maybe not even possible in their current management structure
  - Prices often increase over time, as the subcontractor can benefit from your dependence on their services leaving you in a permanent bind

OPTION 2 - DO IT YOURSELF

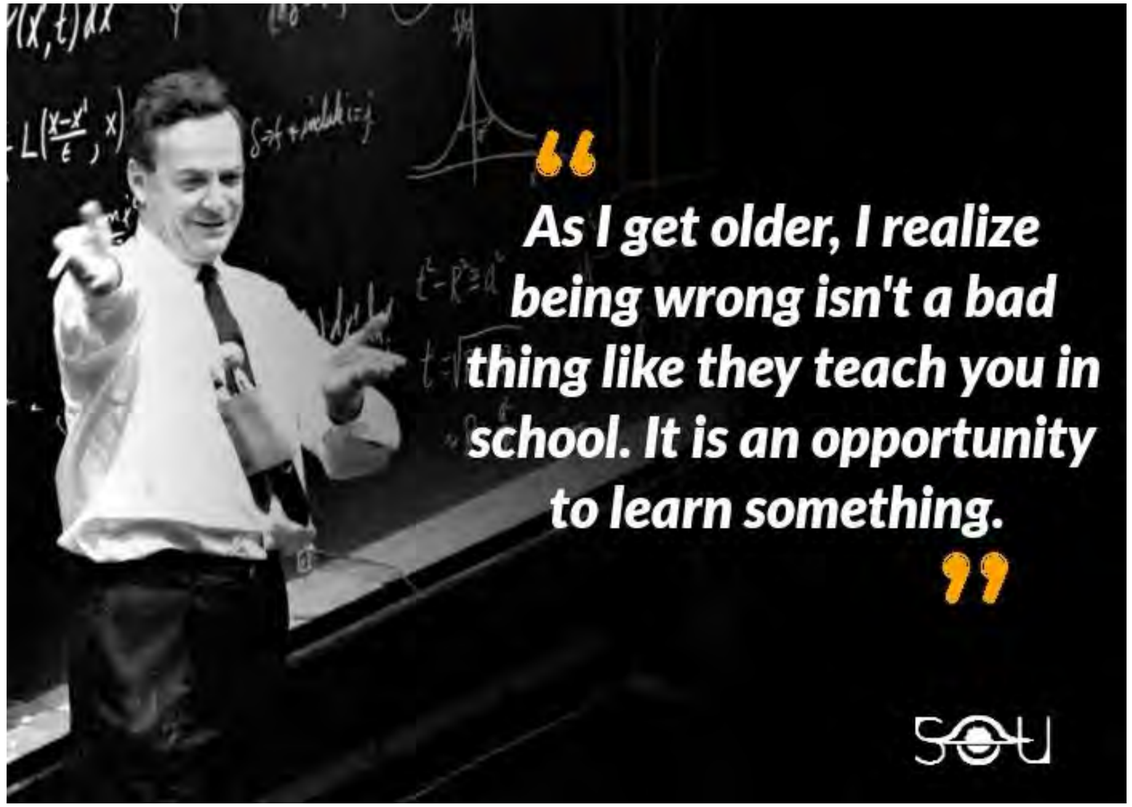
- **Pros**:
  - We obtain IP which is useful to increase our technology stack across our group companies (Off-Grid Europe, Off-Grid Africa, Much Cooler, IOTEM)
  - We can closely support our customers needs and tailor our products to their requirements
  - We can iterate and continually improve our products/services/methods because our teams provide feedback to our manufacturing team and this saves costs and time on the installations
  - Financially we are supporting the creation of local jobs, R&D and enterprise in our own company
  - You will have goodwill from the government as we create local jobs
  - Once you perfect the job you did not sub-contract, you have a new revenue stream
- **Cons**:
  - It is a massive piece of work to set up a business
  - You can end up with huge liabilities in the form of personnel, machinery and property which has a fixed burn rate should your cashflow become reduced
  - You carry 100% of the responsibility if things don't work out (that also applies when you subcontract)

OVERCOME THIS!

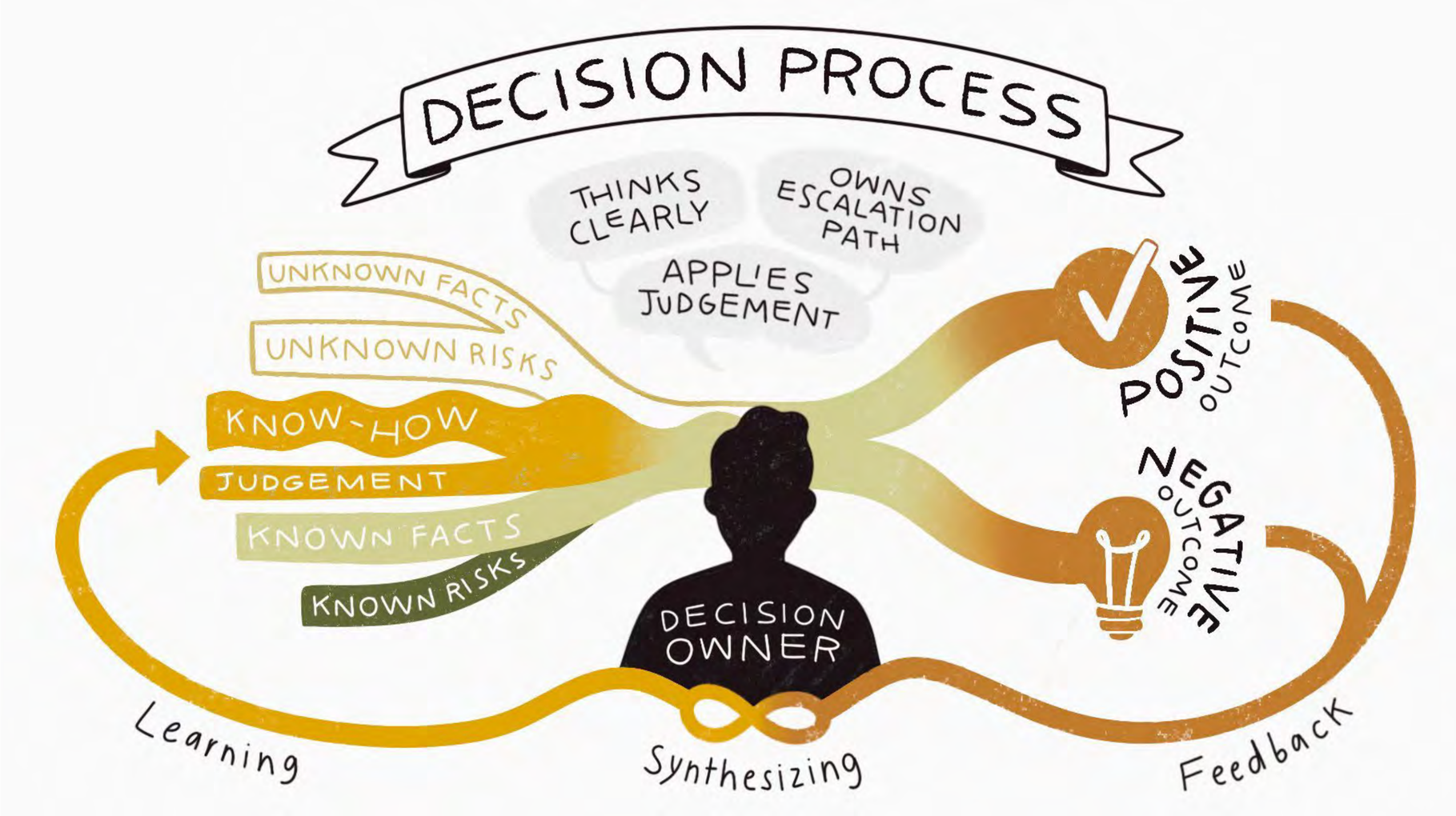


TAKING CHANCE AND MANAGING RISK

- Being wrong is an opportunity to learn
- Make a decision based on your instinct, based on the information you have available at the time
- Decisions lead to valuable information and eliminate ways which don’t work



MAKE DECISIONS AND OWN THEM.
BOTH, GOOD AND BAD!

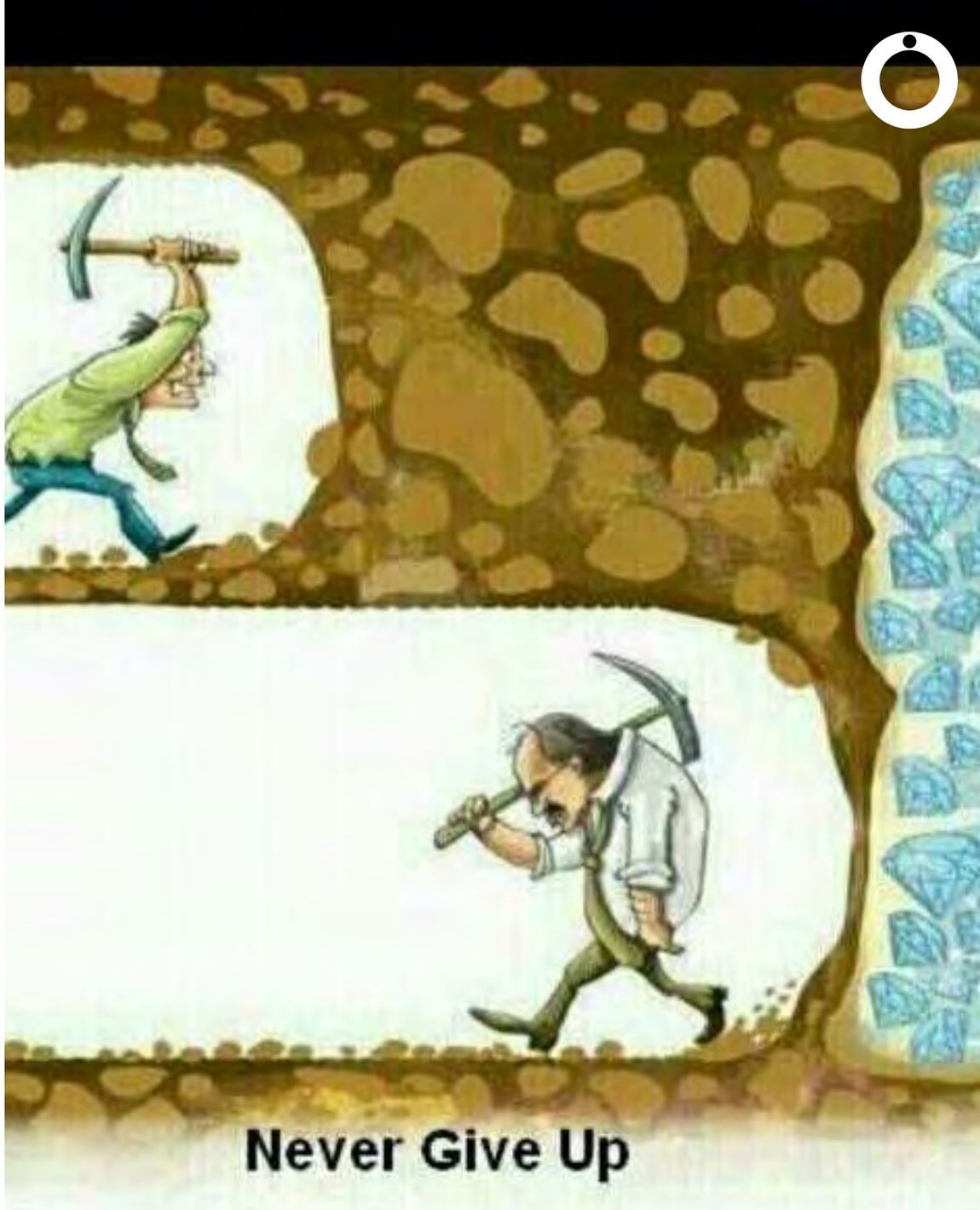


INSPIRE AND LISTEN TO PEOPLE!

- Help people achieve their goals and dreams
- Help people to find their dreams and who they are, not who you want them to be
- Take the time to understand when you are given valuable information which can benefit your goals and appreciate the source
- Foster care and respect around you.
- The behaviour of the people you work with, will determine you are and what your company culture is

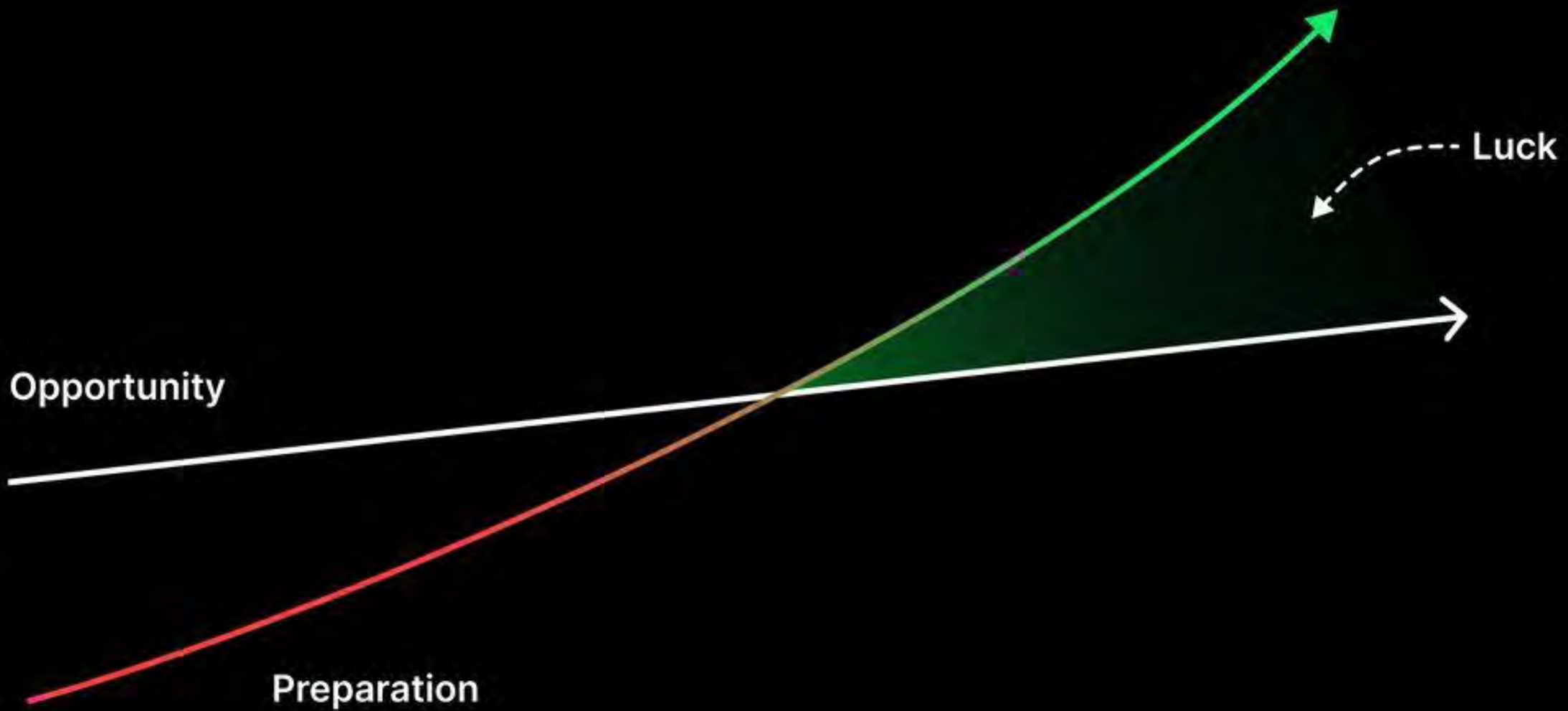
NEVER GIVE UP!

- Your target is sometimes closer than it seems.
- You only know this when you reach it
- You are always one step closer to achieve your goals. Especially when it feels like you took two steps backwards
- Once you give up, you will make no more progress



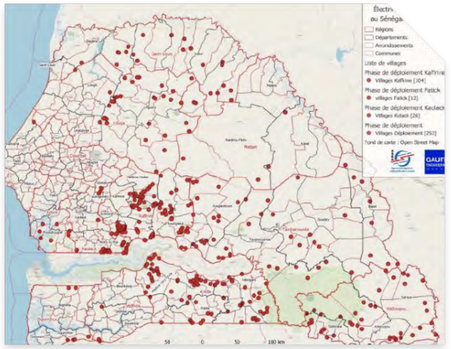
LUCK IS WHEN PREPARATION MEETS OPPORTUNITY

PROJECTS OVERVIEW


Luck
Opportunity
Preparation

FLAGSHIP PROJECT

ASER300



FLAGSHIP PROJECT

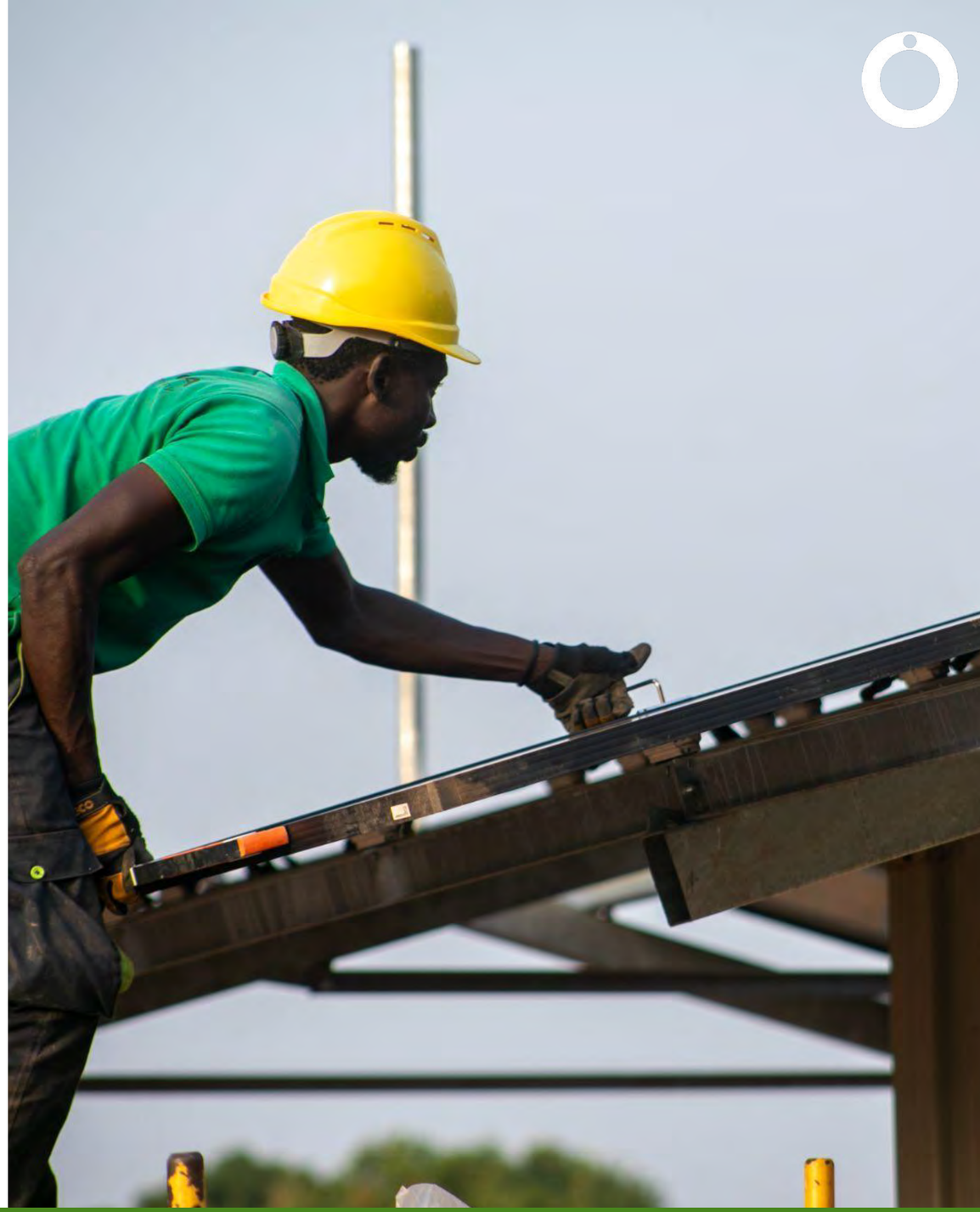
ASER300

ASER300 SENEGAL

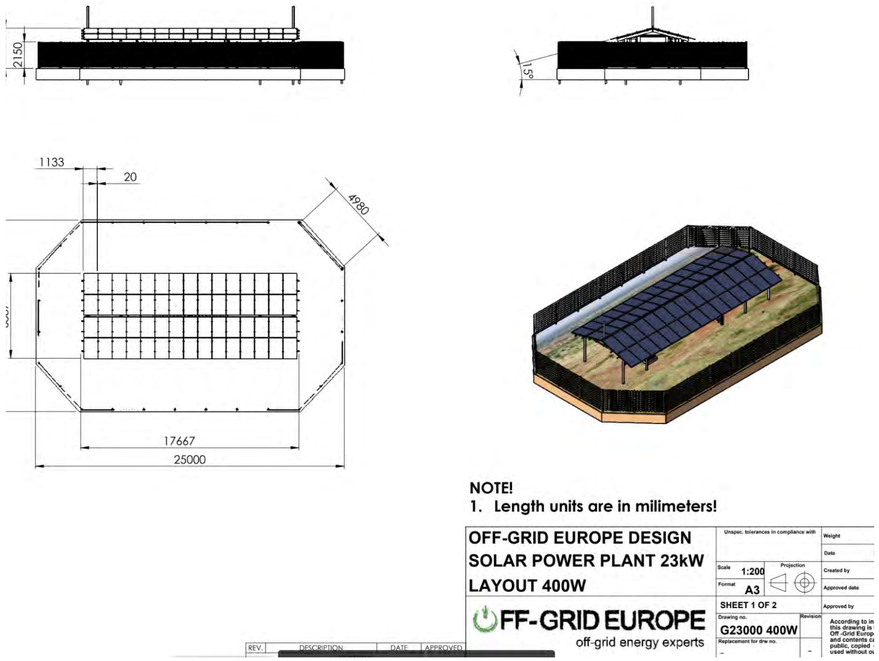
- Design, Procurement, Construction and Commissioning 150+ Villages in Senegal
- On Site Installation and Commissioning of System

PROJECT DETAILS

- Container Build in Germany
- Transport to Senegal
- Installation on site ‘Rolling Circus’
- Hand-over after 1 year
- Distribution material Sangalkam Office
- Commissioning



ELECTRIFYING RURAL SENEGAL WITH MINI-GRIDS & SETTING UP A BUSINESS

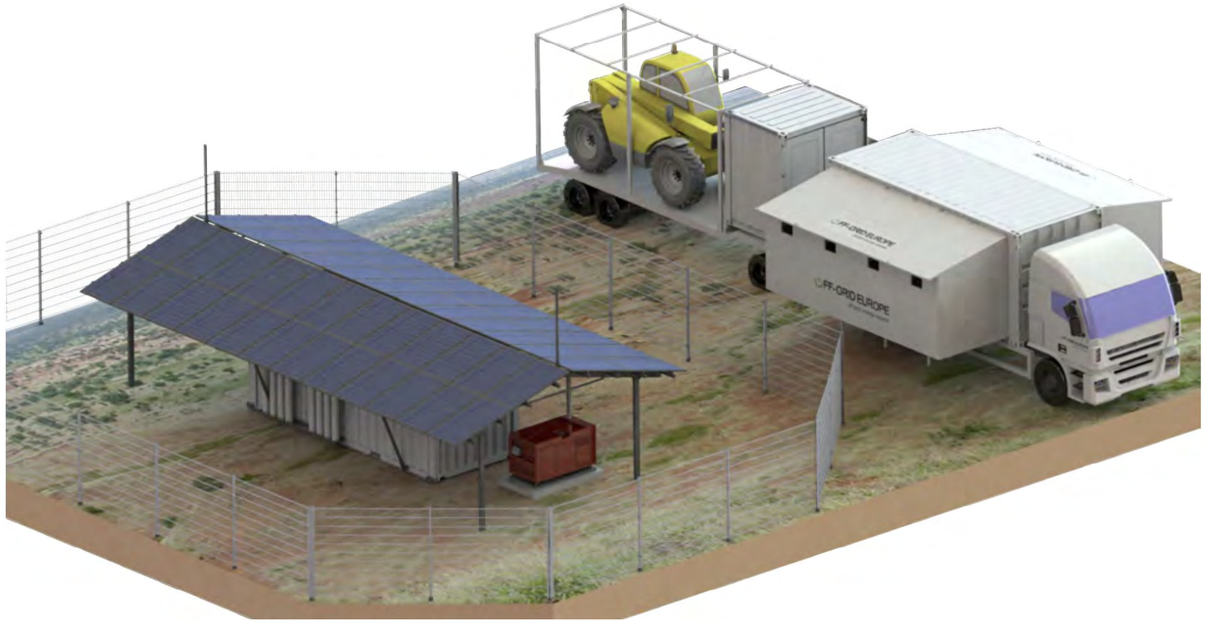


FINDING A SITE IN DAKAR, SENEGAL

RESOURCES - MACHINERY AND TOOLS

RESOURCES - MACHINERY AND TOOLS

THE ROLLING CIRCUS



THE ROLLING CIRCUS

TRANSPORT

THE LAST MILE

INSTALLATION

INSTALLATION

INSTALLATION

FINISHED SITES

FINISHED SITES

FINISHED SITES - STREETLIGHT

SUBSIDIARIES AND JOINT VENTURES

SUBSIDIARY

Installation, commissioning, maintenance
Off-Grid Africa, Dakar, Senegal (founded 2020).

OFF-GRID AFRICA
an Off-Grid Europe company

JOINT VENTURE

Voltares Africa
(together with: Voltares Africa Emergence Group).
Financing energy projects in Africa.

VOLTARES
TRANSFORMATIVE RENEWABLE ENERGY SYSTEMS

MUCH COOLER

Solar powered cooling warehouse for food security, price stability, food quality.

MUCH COOLER
NUTRITION SECURITY | PRICE STABILITY | FOOD QUALITY

OFF-GRID EUROPE
Software

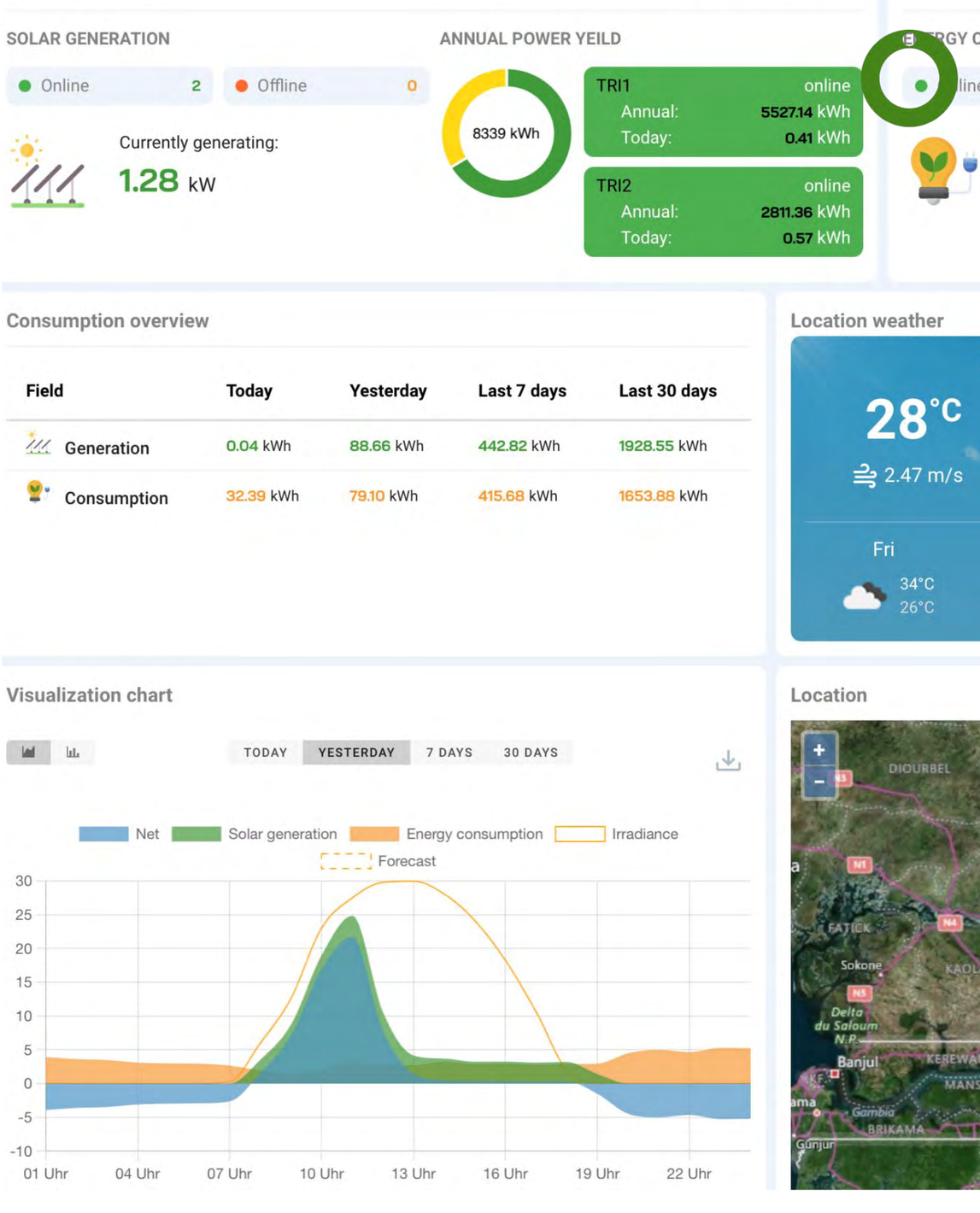
OFF-GRID CONTROLLER

Innovative and intuitive system design and layout, 100% off-grid enabled Integration of Deep Learning and edge computing through our energy management platform.

Fast frequency and voltage reaction.
Continuous monitoring, control and load balancing in real time.
Designed for the Internet of Things (IoT).

Future system expansions implemented through software updates to improve performance and to add additional service and function (i.e. crypto currency).

PV / grid / generator management for optimal return of investment and lifetime.



OFF-GRID EUROPE
Solar Cooling

MUCH COOLER

Complete energy independence through photovoltaic solar panels and continuous power supply through battery energy storage system.

PROJECT DETAILS

- Independent of unreliable electrical grids
- Renewable and sustainable energy sources
- Option for additional income through sale of energy to local grid and grid stabilisation

THANK YOU

‘MODERN ENERGY SERVICES ARE CRUCIAL TO HUMAN WELL-BEING AND TO A COUNTRY’S ECONOMIC DEVELOPMENT’

IEA – INTERNATIONAL ENERGY AGENCY

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