

# GEOHERMAL ENERGY

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**MAKING A POSITIVE DIFFERENCE**



GALAXY CITY™

JULY 2023

# Presentation content

for

## GEOTHERMAL ENERGY

- Holistic Concept
- Principle of Geothermal Energy
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- N.E.S. key people
- Disclaimer

**NEW GENERATION  
GEOTHERMAL ENERGY  
& HOLISTIC  
PRODUCTION SERVICES**



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# Holistic Concept for Sustainable environments & carbon neutral development

using  
Geothermal Energy

Built

DESIGN  
DEVELOPMENT  
IMPLEMENTATION

Operate

PRODUCTION  
LOW CO<sub>2</sub> ENERGY  
MANAGEMENT

Transfer

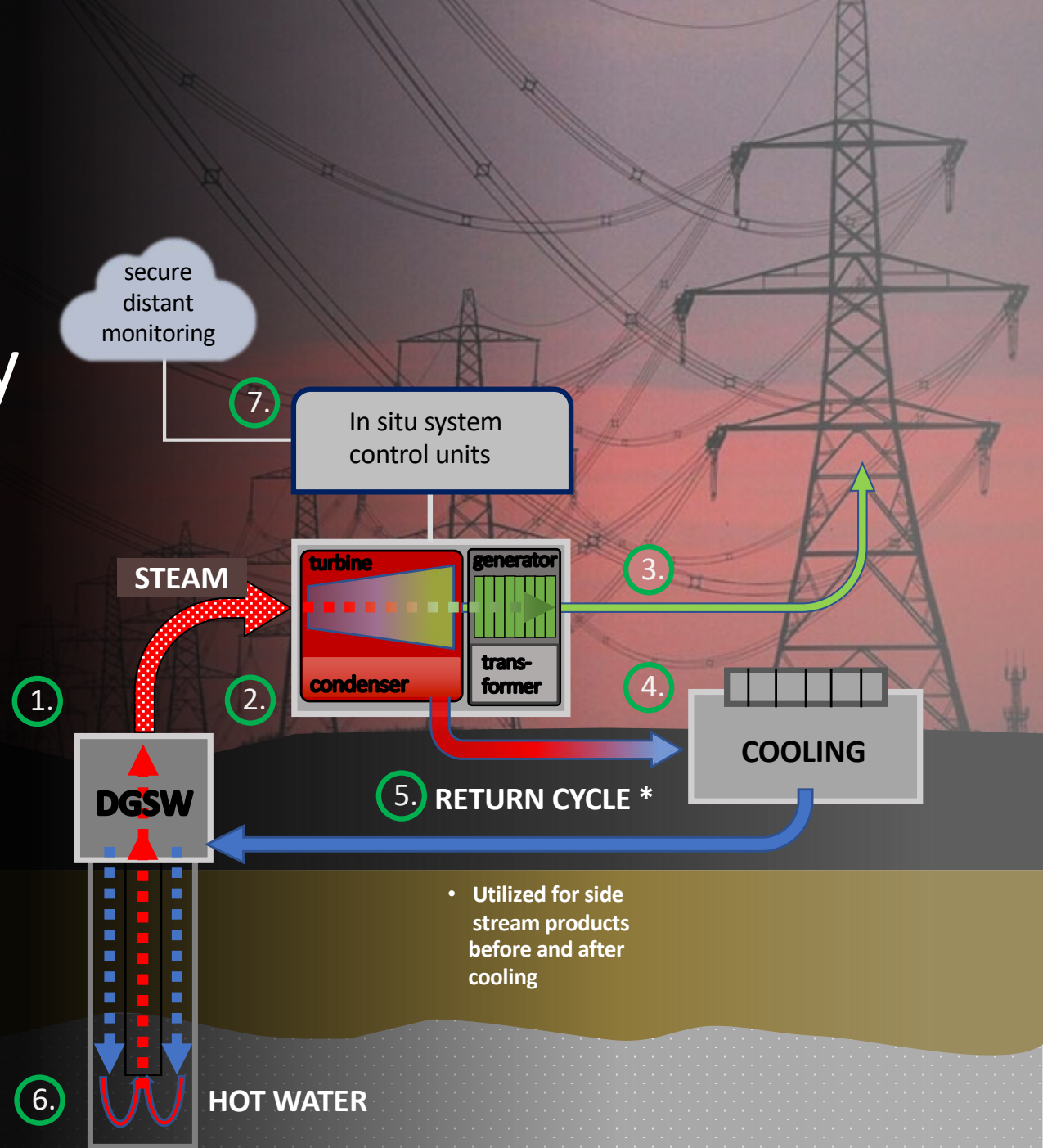
VALUE-ADDED  
SERVICES  
TRAINING



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# Principle of Hybrid DGSW Geothermal Energy

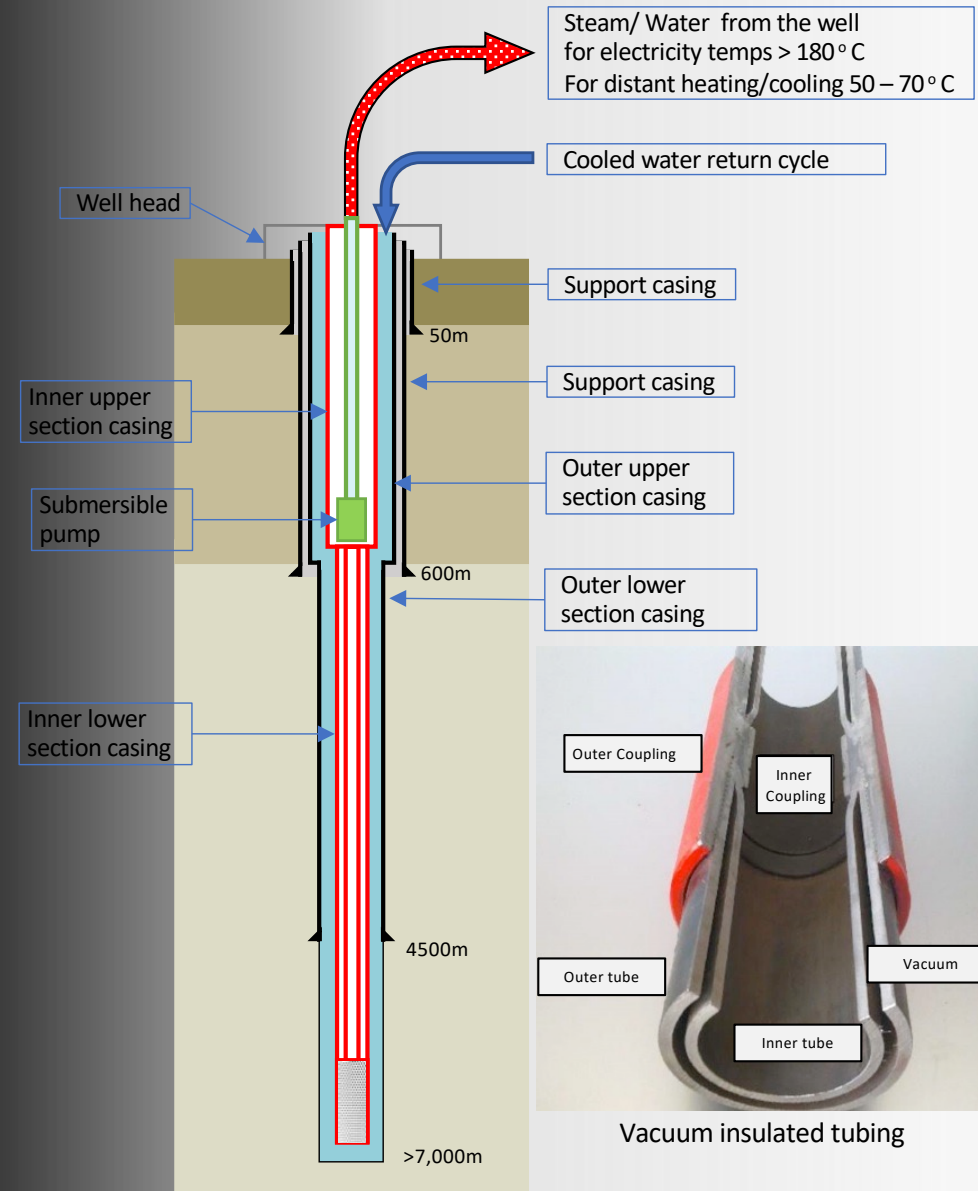
1. Deep Geothermal Single Well
2. Technical Hubs
3. Coupling/feeds to grid & hydrogen production
4. Cooling units
5. Side Stream products
6. Energy source
7. System controls & monitoring



# 1. Deep Geothermal Single Well

## The means for limitless low carbon Energy

- **The used well depth** depends on the optimum temperature required for energy production.
- **Volcanic regions** are optimal for electricity production, where average well depths varies from 1,500m to 3,000m.
- **In other regions** well depths are up to 10km.



Closed water circuit heated by ground heat



## ② Technical Hubs

Modular and scalable hubs for

- Turbines
- Generators
- Condensers
- Other technology units based on need, such as:
  - ORC systems
  - PV systems



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### ③ Couplings / feeds

## For the Grid and customized spot production

- **Transformers** and needed coupling equipment for feeding electricity to the grid or for the spot production.
- Electricity for production of green Hydrogen



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## 4. Cooling Units

- **Cooling** by modular units before recycling the water back to the DGSW well for re-energizing.

## 5. Side Stream products

- As part of the recycle process return water can be used for hybrid products such as
- Distant cooling or heating
- e-fluids and biofuels



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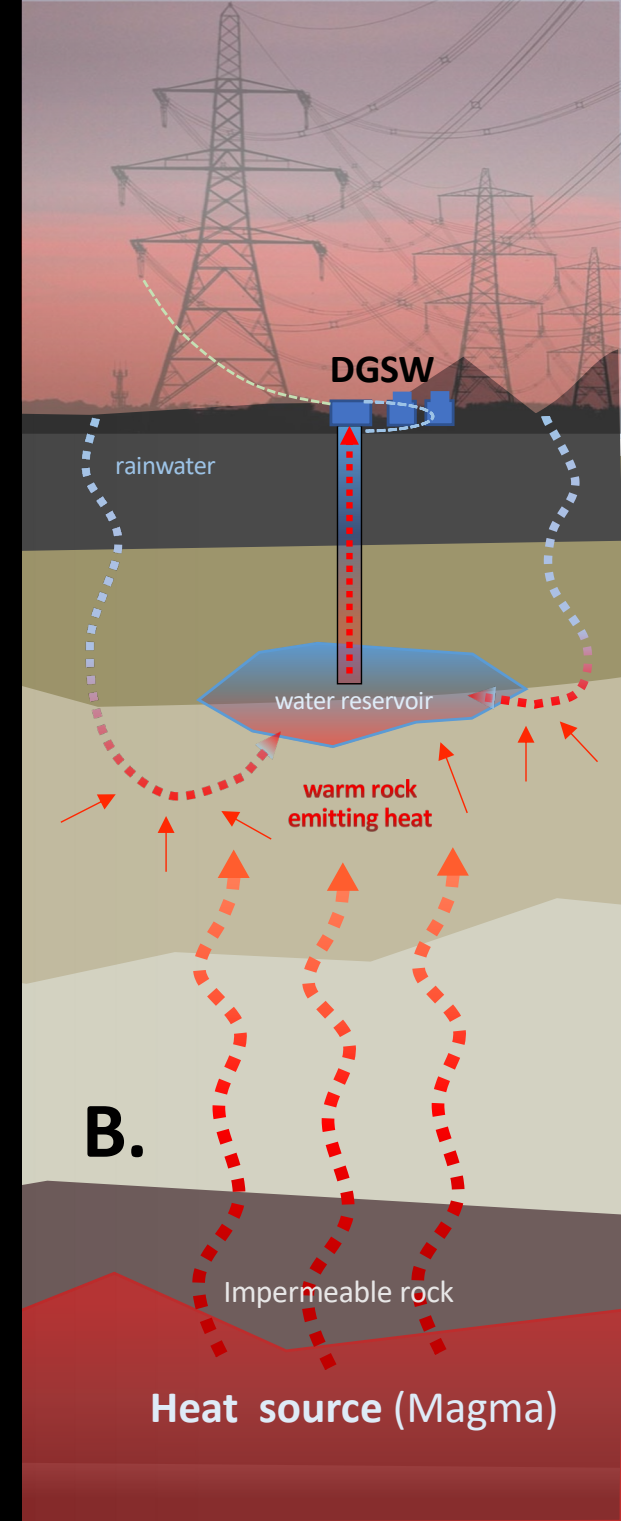
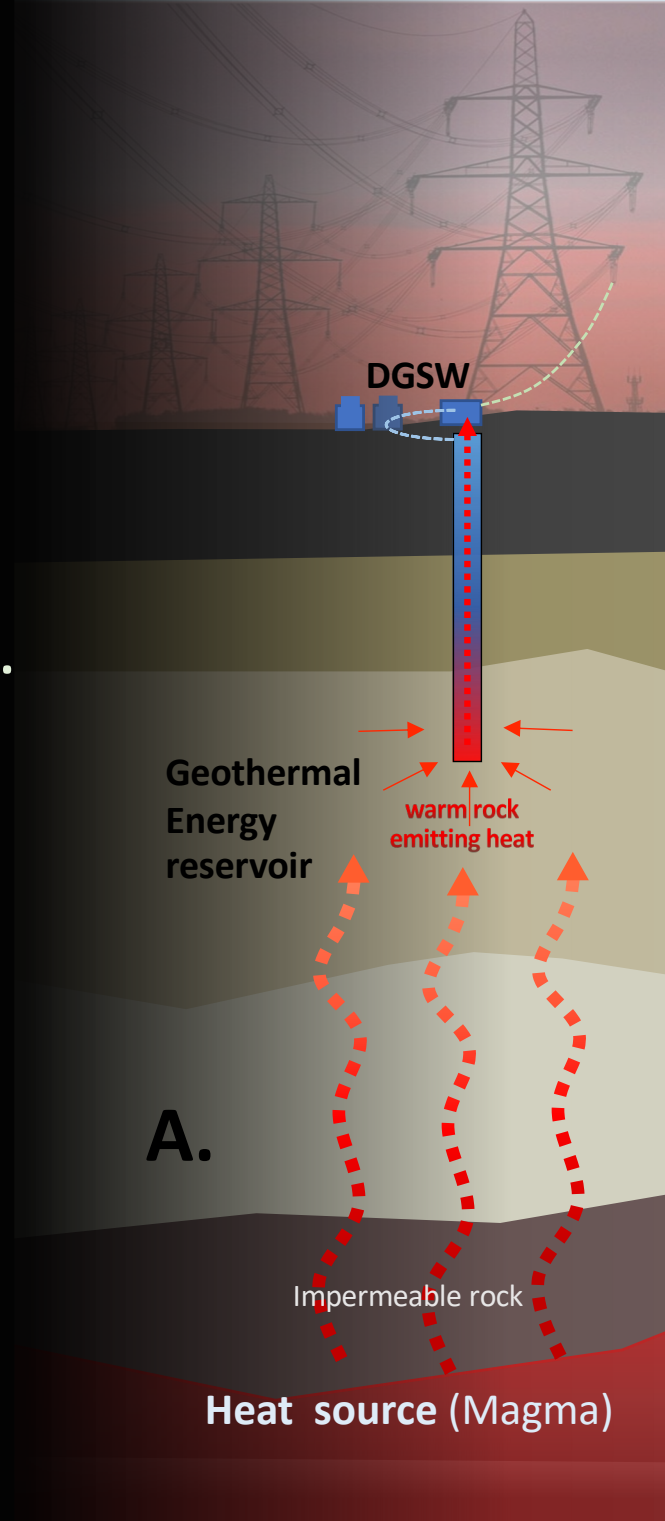
## 6. Energy sources

There is

**50,000 times more  
Geothermal energy**

in the ground than all fossil  
fuels combined in the world.

- A. Energy retrieved from the  
bedrock storage (geothermal  
source)
- B. Energy retrieved from the  
underground water pool  
(hydrothermal resource)



# ⑦ System Control & monitoring

In situ & cloud services

System high quality main components have been sourced from international trusted partners and suppliers

Cloud services monitor the facility operations and provide data for users



# Solutions for renewable carbon free energy

- Industrial scale Electricity
- Distant heating & cooling
- Customized spot market production
- Green Hydrogen
- Water Desalination

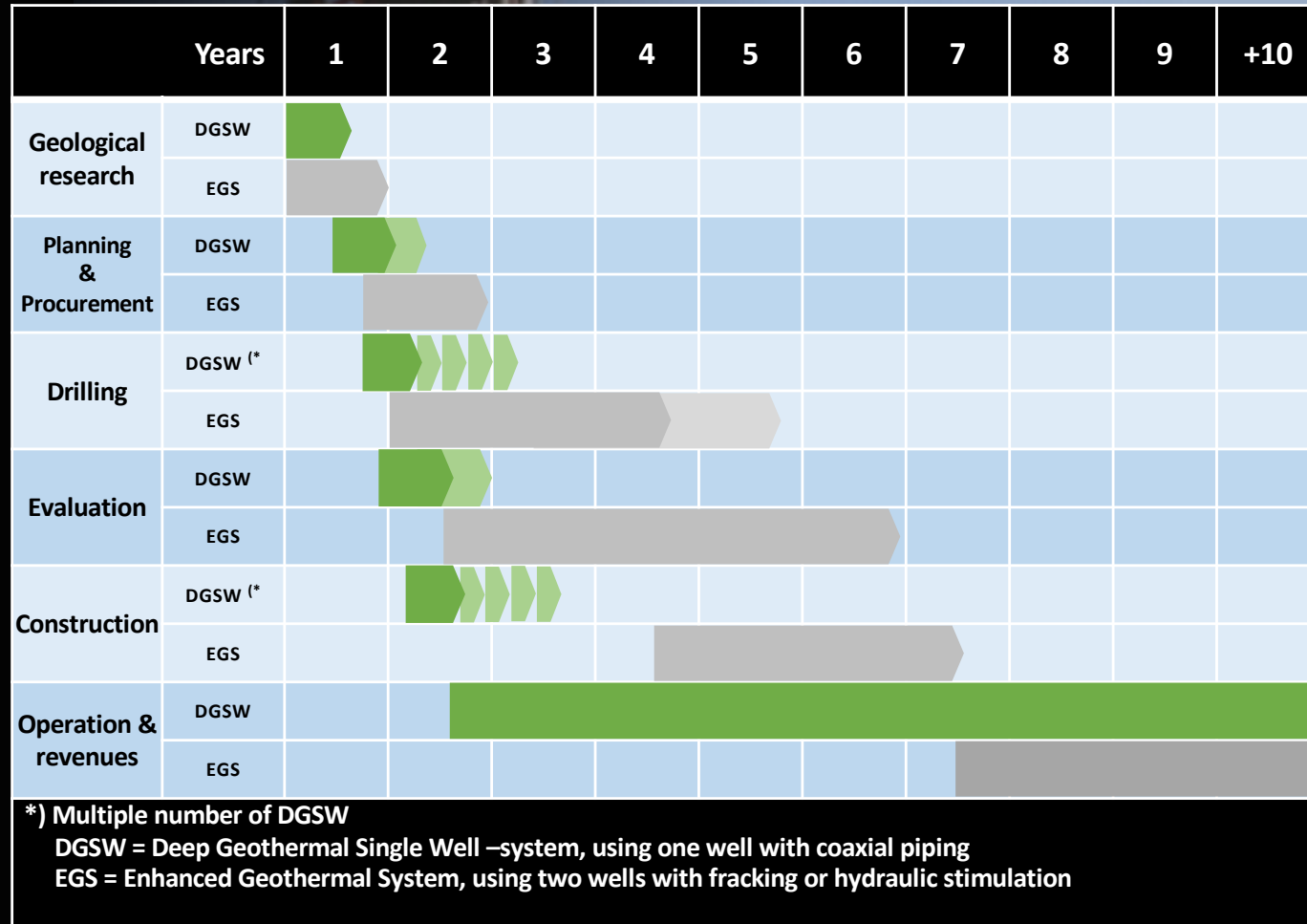


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# Competitive Advantages

## 1. DGSW compared to EGS geothermal facility

- implementation efficiency
- Drilling time & costs
- Construction time & costs
- Space utilization efficiency
- Faster operation start and revenue generation
- Operational cost efficiency
- Environmentally safe
- Long service life



# Competitive Advantages

## 2 . Drilling technology

- Patented technology
- Safe fast drilling
- Into depths up to 12km
- Water hammer technology



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# Competitive Advantages

## 3. LEC costs compared to other energy sources

Description	DSGW electricity	Solar PV	Wind on shore	LNG	HFO	COAL conventional
Proportional establishment cost MUSD /MW	2.0 – 2.5 <sup>(1)</sup>	1 – 1.8	1.2.- 2.0	1.1 – 2.2	0.8 – 1.0	1.5 – 2.3
Capacity Factor (CF) <sup>(2)</sup>	>90%	21%	32%	60%	45%	40%
Annual production capacity (h) , CF noted <sup>(3)</sup>	8200	1840	2800	5250	3940	3500
LCOE USD/ net output kWh <sup>(4)</sup> Levelized Cost of Electricity	0.04	0.05	0.06	0.09	0.08	0.09
TOTAL Carbon emissions (g/kWh)	c. 0 - 8 <sup>(5)</sup>	53	29	559	742	957

- 1) Subject to changes due to location and subsurface condition related actual data, drilling depth and electricity transfer line costs.
- 2) Global average actual production efficiency
- 3) Theoretical max 8760h/annum (24/7 production time)
- 4) LCOE global average without taxes, duties, grid transmission charges, government subsidies
- 5) Plant implementation time carbon emission 8g/kWh, during plant operations carbon emissions near 0g/kWh

Based on 2021 FIT, PPA and C.C.. Rates  
Source: IRENA, ITA , NREA & EBRD

# Key people



**Risto Louhisola**, Chairman / DG, (MSc, MBA)

Mr. Louhisola has over 38 years of strong background in international design, management, project development in Finland, U.S.A., Germany, Hong Kong, China and Philippines. Currently he is focused on geothermal energy projects in MENA, and Africa in connection with related real estate and community developments.



**Jussi Salminen**, CTO, (BSc, engineer technology)

Mr. Salminen has over 30 years of experience in engineering and turn-key project management. He has vast international experience in Asia-Pacific, Europe, USA and Canada with partners such as Nokia, Bosch and G.E. Currently he is concentrating on geothermal energy projects in Finland and North Africa.



**Peter Hogg**, GM China and Middle East operations

Mr. Hogg has worked in Far and Middle East over 40 years. He is a founder of private insurance brokerages in Dubai and China and a co-founder of a Hong Kong based healthcare consulting agency. He promotes and cooperates with partner companies in the Far and Middle East regions is heading our compliance team.



**Mr. Wesam Rehan**, Regional Director Egypt

Mr. Rehan has over 25 years experience with international business in financial and logistic sectors. He has acquired excellent business development and networking skills with extensive on-ground knowledge. In charge of negotiations in the region with the government agencies and private sector partnerships.

## Legal issues:

Head legal counsel; Heikki Kiesi / Kiesi Juridia, Espoo Finland  
Sub-Saharan Africa Roland Abend/ Abeng law firm, Douala Cameroon

**Iiro Hiltunen**, D.Sc. Research and Technical development

Mr. Hiltunen has a doctorate in Renewable Energy and Electromagnetics. He has over 15 years experience in product and project management. He has profound knowledge in renewable energy, modern drilling technologies with deep background in technology development, patenting and research with good global connection.

**Martti Kivilinna**, COO, the head of geothermal operations

Mr. Kivilinna has over 20 years experience in construction business, deep drilling and has managed the construction and implementation of the first geothermal heat plant in Finland. He has extensive international supplier network and focused on training and leadership.

**Ignace Nomo Nomo**, Business Manager for West and Central Africa

Mr. Nomo is a qualified accounting and business professional. He has a solid experience in international business, which he acquired before retiring from the Chief accountant for Lufthansa Airlines West Africa Operations. Currently he is focused on creating opportunities and advising businesses in public relations, in issues relating to financing and taxation.

**Nusret Akcay**, BEc, N.E.S. representative in Americas

Mr. Akcay has a strong background in business development with experience in real estate, construction, infrastructure and renewable energy. He has vast business connections globally and is involved in developing and structuring new ventures for Americas' market. He is heavily involved in humanitarian and international developments.

## Advisors:

Finance: PhD Jukka Saarikko /Revise Oy, Helsinki Finland



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TOGETHER FOR  
A BETTER  
TOMORROW



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