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# ABB's integrated offering for harvesting Geothermal energy

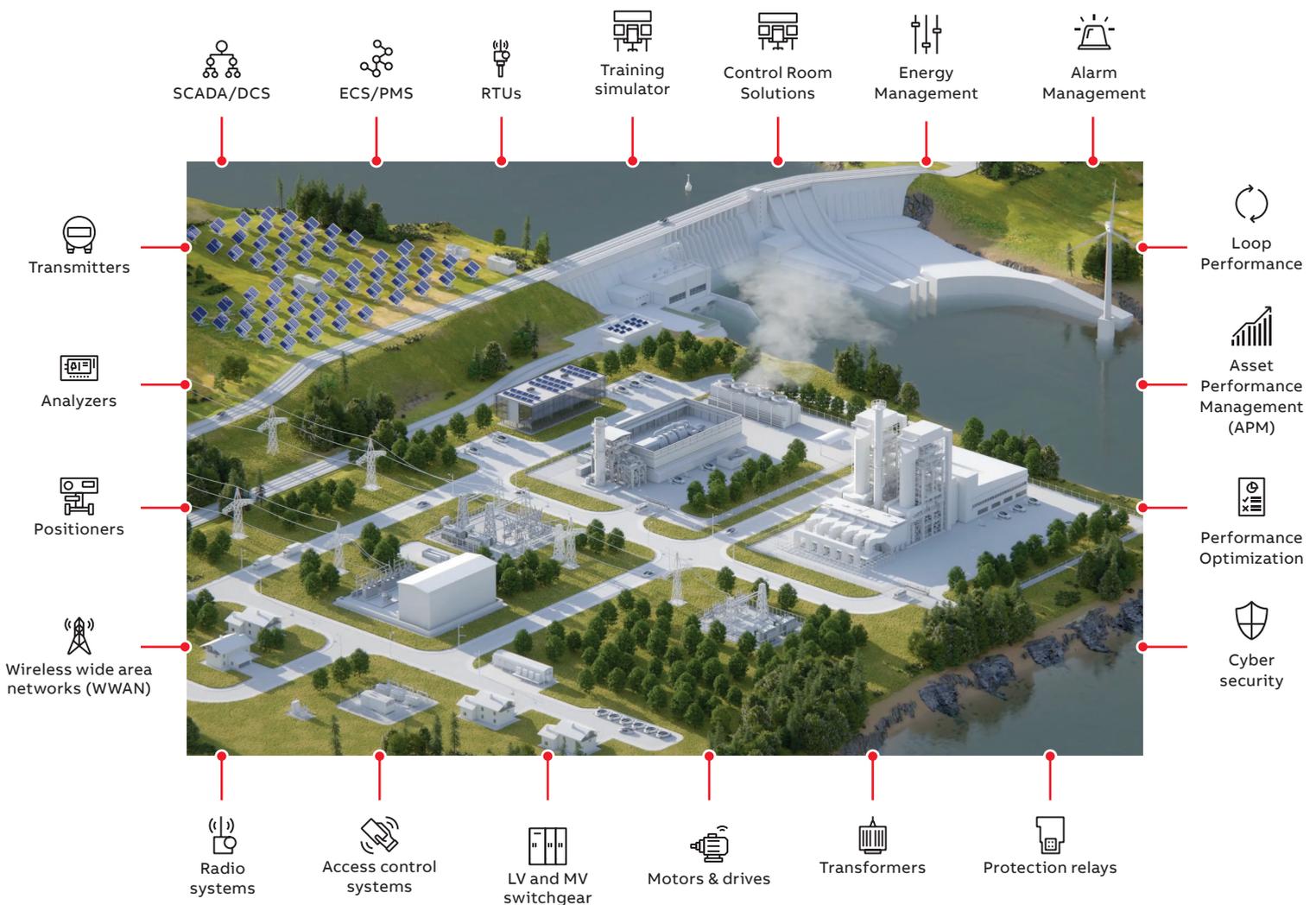
# ABB offers a complete integration of automation, electrical and telecommunications

Geothermal energy is a sustainable, renewable resource that can play a useful role in the transition from fossil fuels to a low or zero carbon future.

It has a major advantage over renewables like wind and solar in that it is not intermittent. As a reliable and consistent source of power, it can meet demands for continuous baseload electricity. Geothermal energy can be harnessed to generate electricity, and it can be utilized directly as a source of heating. It has been estimated that by 2050 geothermal could potentially meet 3-5% of overall global demand for power and heating. The most

favorable locations for utilizing geothermal energy are the geothermal hotspots – regions where high temperatures are found at relatively shallow depths. Depth is important because drilling is expensive and typically accounts for around half the total cost of a power generating facility.

Harnessing this endless bounty of heat to help decarbonize modern society is fully feasible. It simply requires getting closer to the source. With partnerships and experience to enable geothermal energy, wherever you are located, ABB offers an integrated solution with one single HMI for all your sub-systems. Contact us to learn how you can benefit from our intelligent solutions as shifts in automation change the way you work.



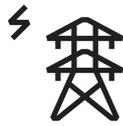
# Combining automation, electrical, and telecommunications systems.

Benefit from our intelligent product solutions as shifts in automation change the way you work. Our expertise in electrification helps you achieve safe, reliable and efficient operations. Information and communications

technology with specialized telecommunications offers you the right analytics, for better management of your onshore and offshore business.

## Electrification

ABB makes the electrical products that distribute electricity reliably and efficiently around the plant. We also generate electricity with rotating machinery that reduces power consumption and costs.



## ABB Ability™

Save costs up to

**30%**

by integrating electrification, automation and telecommunications



## Automation

ABB measures, analyzes and integrates all of the data from the plant's equipment into a single automation system that keeps the plant safe, reliable and efficient.



## Telecommunications

ABB provides a comprehensive telecommunications solution for our customers that ties critical data or information into the control room.

## ABB Ability™

ABB Ability is our unified, cross-industry digital offering - extending from device to edge to cloud - with devices, systems, solutions, services and a platform that enable our customers to know more, do more, do better, together.

ABB Ability connects our customers to the power of the Industrial Internet of Things and, through our services and expertise, goes further by turning data insights into the direct action that "closes the loop" and generates customer value in the physical world.

# A transformative approach that yields measurable improvements and strengthens financial performance.

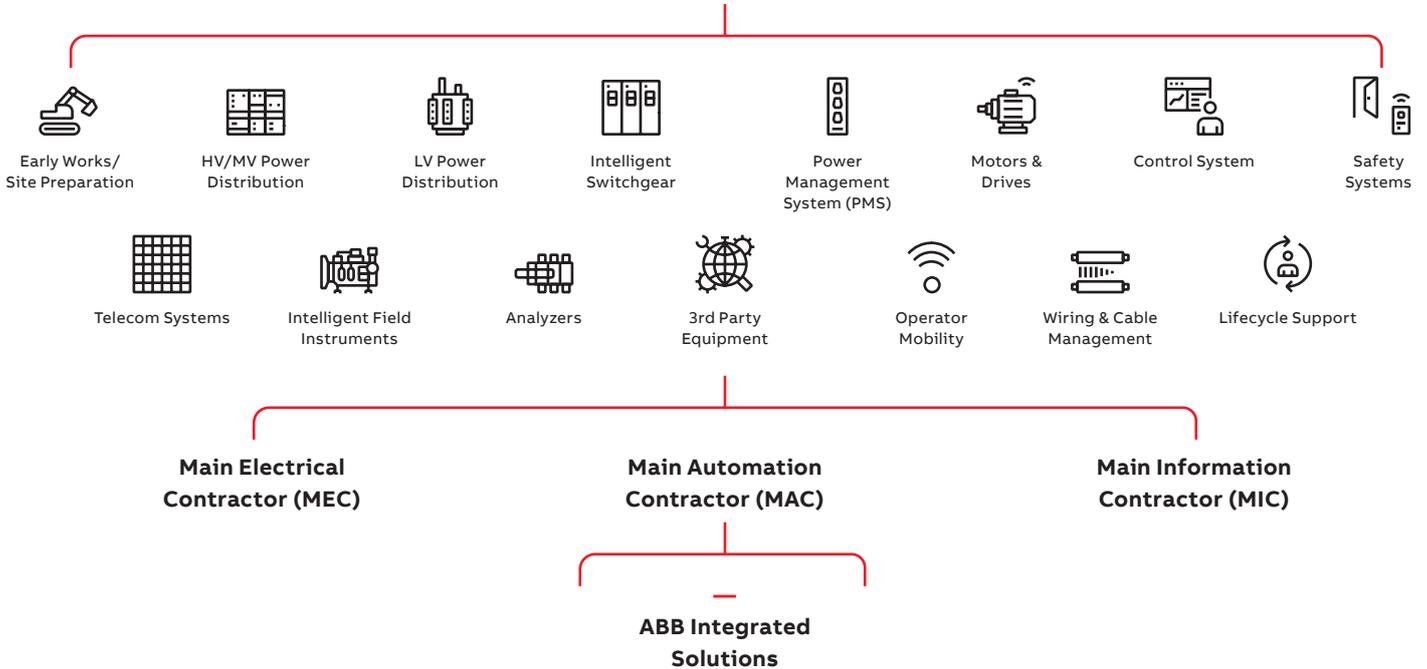
Energy producers encounter multifaceted challenges in executing projects. With ABB Adaptive Execution™, an end-to-end solution designed to help energy producers seamlessly solve unexpected project challenges while improving key business metrics. We grant you access to a dedicated team of experts armed with the latest technologies and agile processes that will collaborate with your team and share insights and proven methodologies to drive efficiencies and ultimately elevate your financial success.

With ABB Adaptive Execution™, you can navigate uncertainties with unwavering confidence, knowing that we're standing by your side every step of the way.



# Adding value through integration across multiple packages

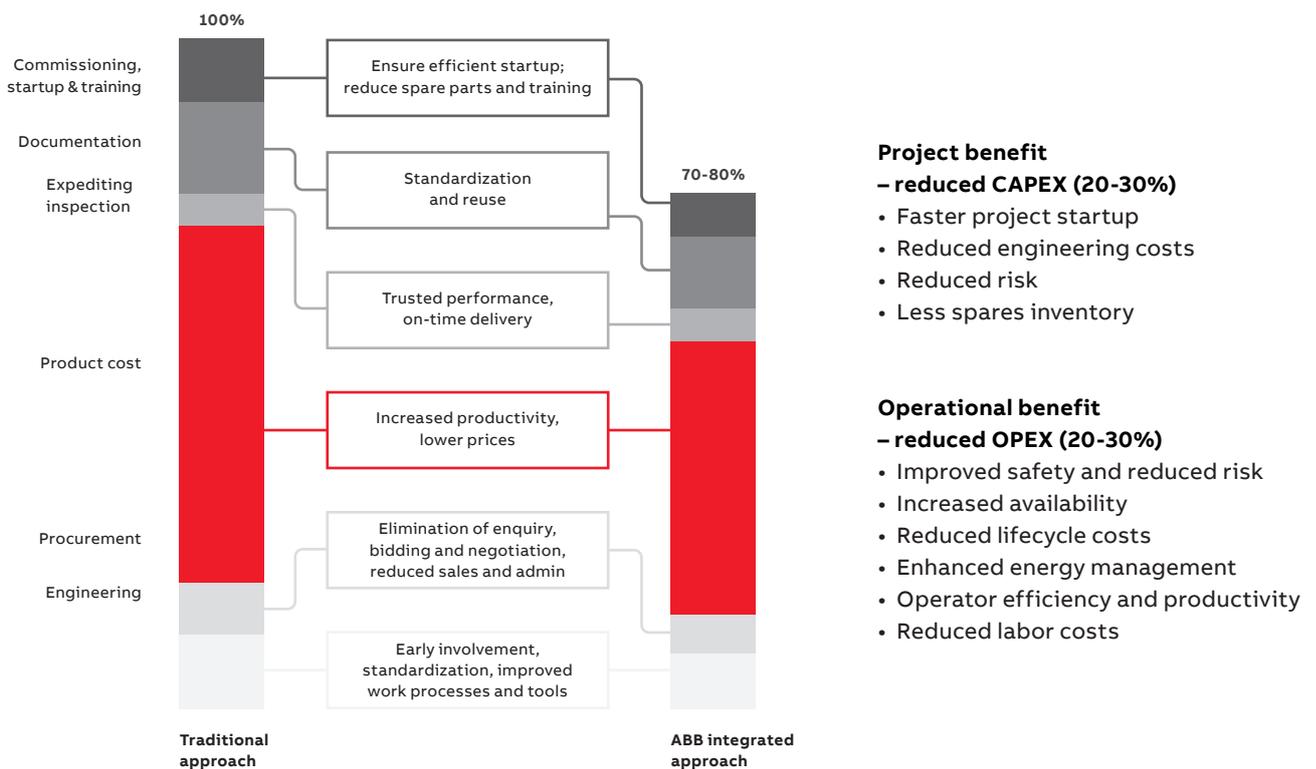
## Lifecycle Management



## Single source provider

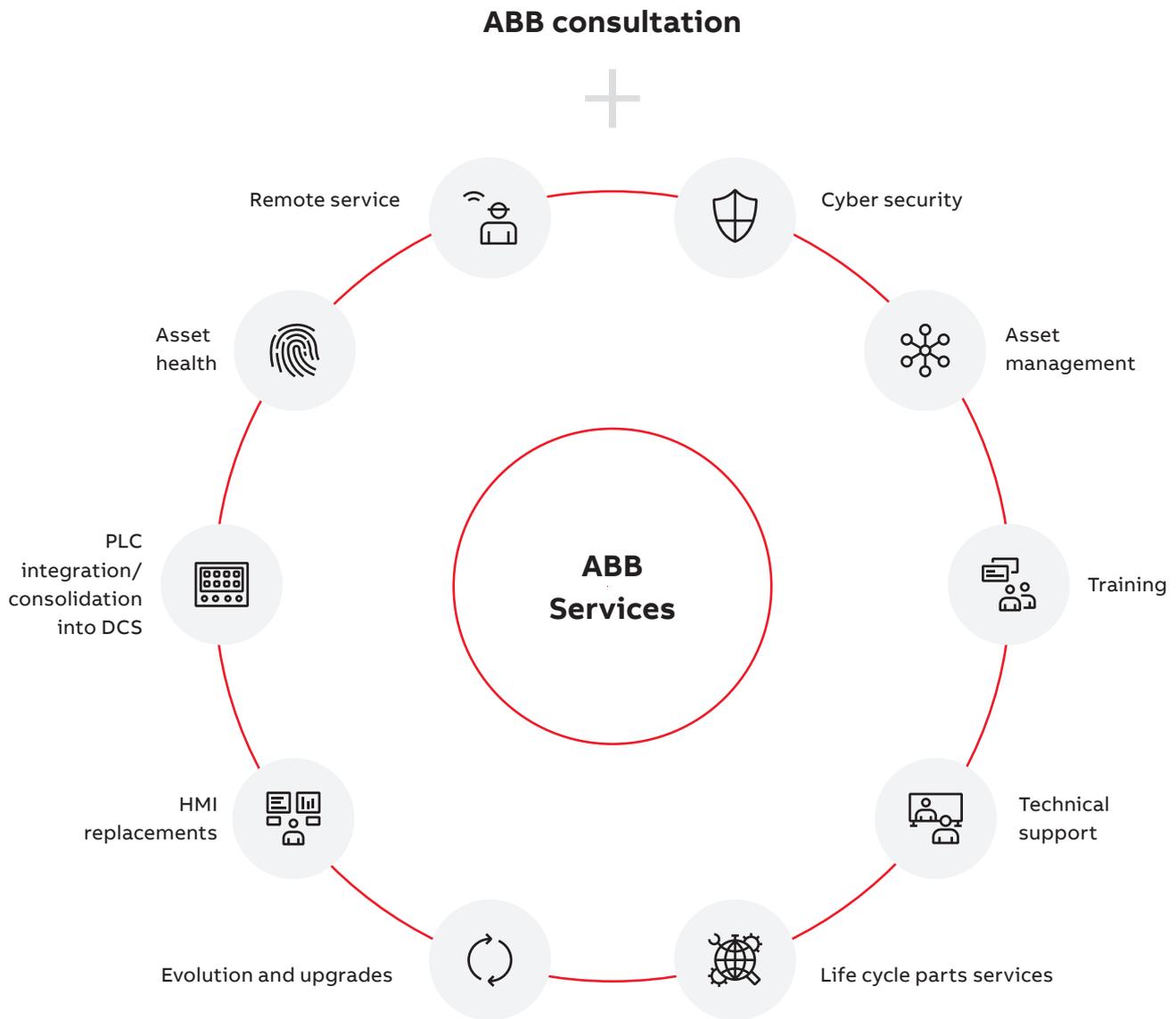
Using ABB as a single source system integrator to bring complex and remote systems and subsystems on line avoids risks associated with managing multiple suppliers, such as fragmented responsibilities,

complications, delays and cost overruns. As a single source supplier, ABB bears the cost and risk of interfacing with the various disciplines and subsuppliers.



# Services

Keep your plant running smoothly with ABB Care



## The situation

As new geothermal facilities are being planned, we can help from a consultation perspective to ensure that the various disciplines are optimized, and we can help from the long-term serviceability to the installation and commissioning

## Our offering

ABB provides flexible annual service agreements tailored to the customer's specific needs. These agreements may include a simple support rate or be built up to cover a plant's complete electrical services needs to keep it running smoothly. As indicated by the service wheel on the right, ABB offers a whole portfolio of automation, electrical and software services, to cover a plant's complete electrical services.

## Benefits

- Increased uptime
- Reduce risk of failures
- Increased ROI through continuous improvement

## Available services

- Cyber security software and services
- Asset management
- Annual and on-demand training
- 24/7/365 technical support
- Life cycle parts management
- System evolutions and upgrades
- HMI upgrades and replacements
- PLC integration/consolidation into DCS
- Asset Health Management
- Remote and on-site service

# World wide references

1

**Plant Name:** Aidlin Power  
Plant in California  
**Plant Size, Type:** 1590 MW

2

**Plant Name:** City of Manisa  
**Plant Size, Type:** 45 MW, GEPP

**Plant Name:** City of Denizli  
**Plant Size, Type:** 165 MW, GEPP

**Plant Name:** City of Manisa  
**Plant Size, Type:** 48 MW, GEPP

**Plant Name:** City of Denizli  
**Plant Size, Type:** 20 MW, GEPP

**Plant Name:** City of Aydin  
**Plant Size, Type:** 17 MW, GEPP



3

**Plant Name:** Muara Laboh  
Geothermal Power Plant  
**Plant Size, Type:** 1 x 85.26 MW,  
Flash Type

4

**Plant Name:** Tauhara  
**Plant Size, Type:** 174 MW,  
Flash Type

**Plant Name:** Wairakei  
**Plant Size, Type:** 14 MW,  
Binary Type

**Plant Name:** Lahendong GPP 5&6  
**Plant Size, Type:** 2 x 21.5 MW,  
Flash Type

**Plant Name:** Te Huka  
**Plant Size, Type:** 23 MW,  
Binary Type