

PUBLIC

HITACHI
Inspire the Next

EnCompass™ Agreements - Your Service Partnership today and tomorrow

Energy & Digital World (EDW) 2024, Knowledge Session 2.4, 14:30-15:30

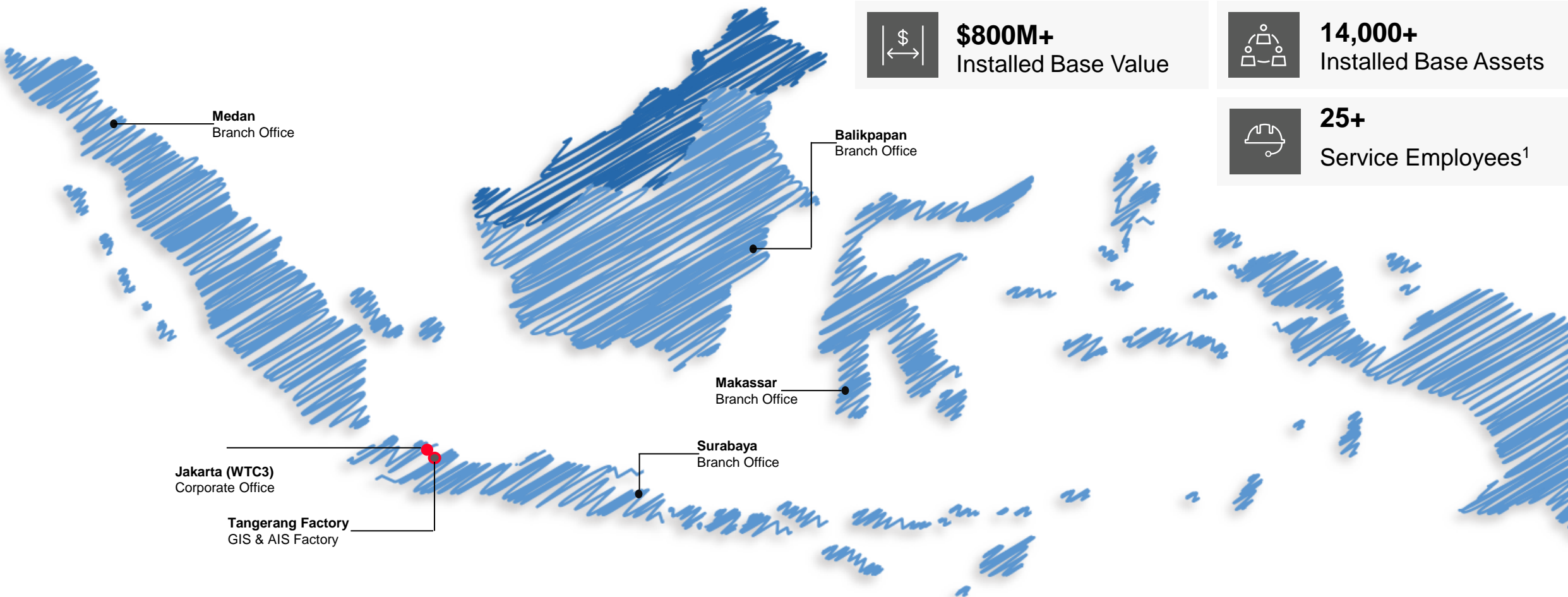
Fachri, Senior Technical Engineer, Grid Integration

Agenda

➤ **Introduction**

➤ Case Studies

➤ Q&A



Providing life-cycle services for the breadth of the T&D value-chain, with segment and application-specific solutions

Utility	Industry	Renewables	Data Centers	Microgrids	Rail	HVDC	Power Quality	EV Charging	Software & Automation
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Sustainable

Enabling a carbon-neutral energy system through renewable integration, highly efficient end-to-end electrification including industry and transport, and our eco-efficient portfolio

- EconiQ™ consulting and advisory for renewable integration
- EconiQ™ retrofill and eco-efficient retrofits
- EconiQ™ upgrades and modernization services
- Grid-eMotion™ electrification of transport and industry



Flexible

Enabling energy systems to actively minimize consequences of unexpected failures
Scalable. Reliable. Resilient. Digitized.

- Network control for adaptive protection and control
- Sensoring and monitoring of operating assets
- Modular partnership agreements
- Energy storage and energy management solutions

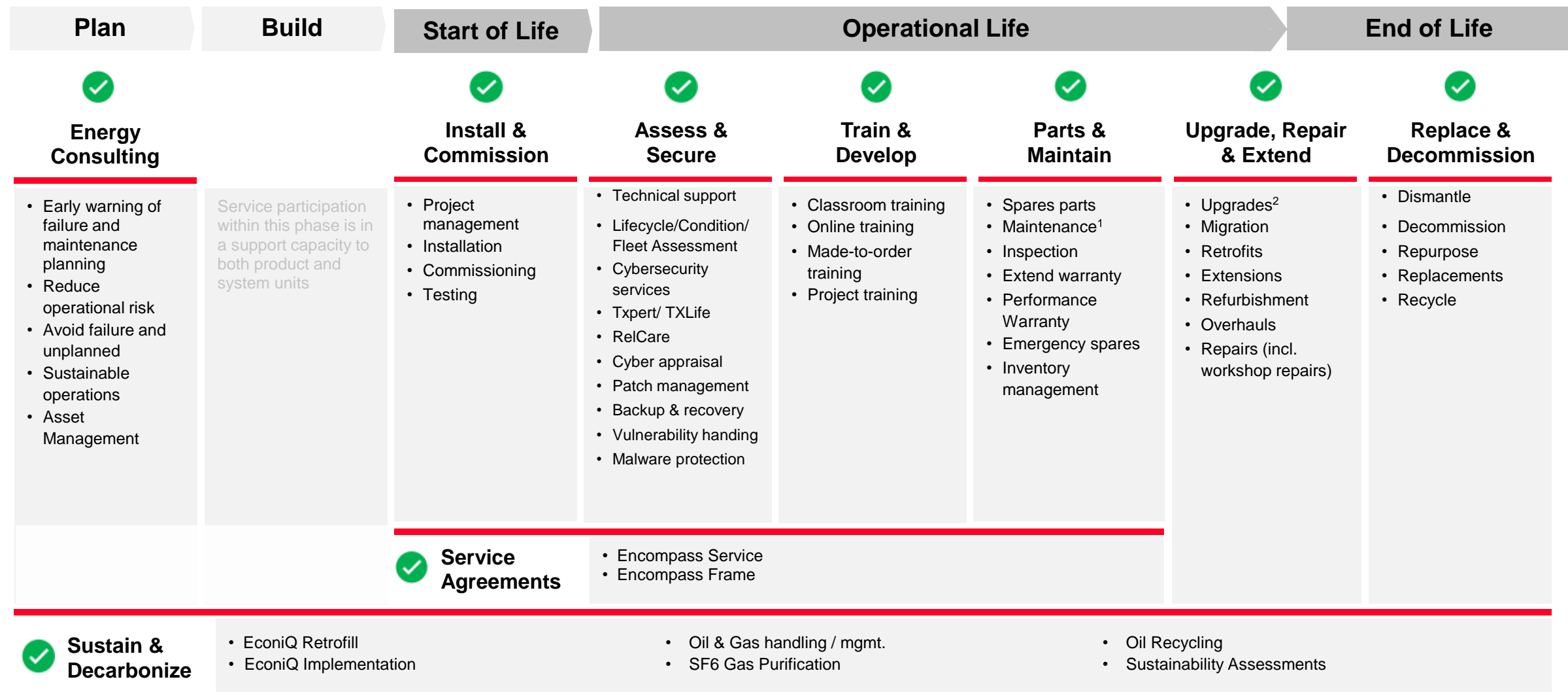


Secure

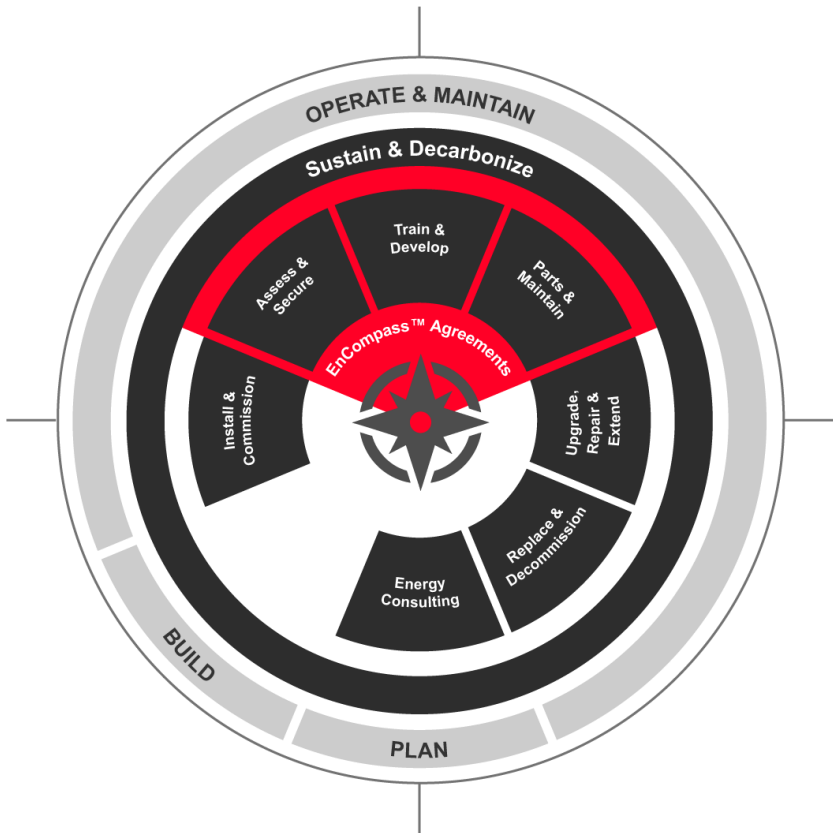
Ensuring safe & secure mission-critical infrastructure with expert services and a flexible cyber and physical security offering

- Uncompromised, safety-first service procedures
- Cybersecure services, products, and process
- Software-enabled service for timely intervention
- Remote expert services leveraging AR

Our service portfolio spans the entire asset lifecycle



Our EnCompass™ Agreements pave the way for sustainable and resilient end-to-end support, covering products, systems, and accessing specialized services tailored to your needs.



Benefits:



Exclusive 24/7 premium access to our industry-leading expertise and insights, empowering you to make informed pathway choices



Creates easier & faster access to our vast service portfolio of integrated and scalable services across Hitachi Energy, driving your increased productivity



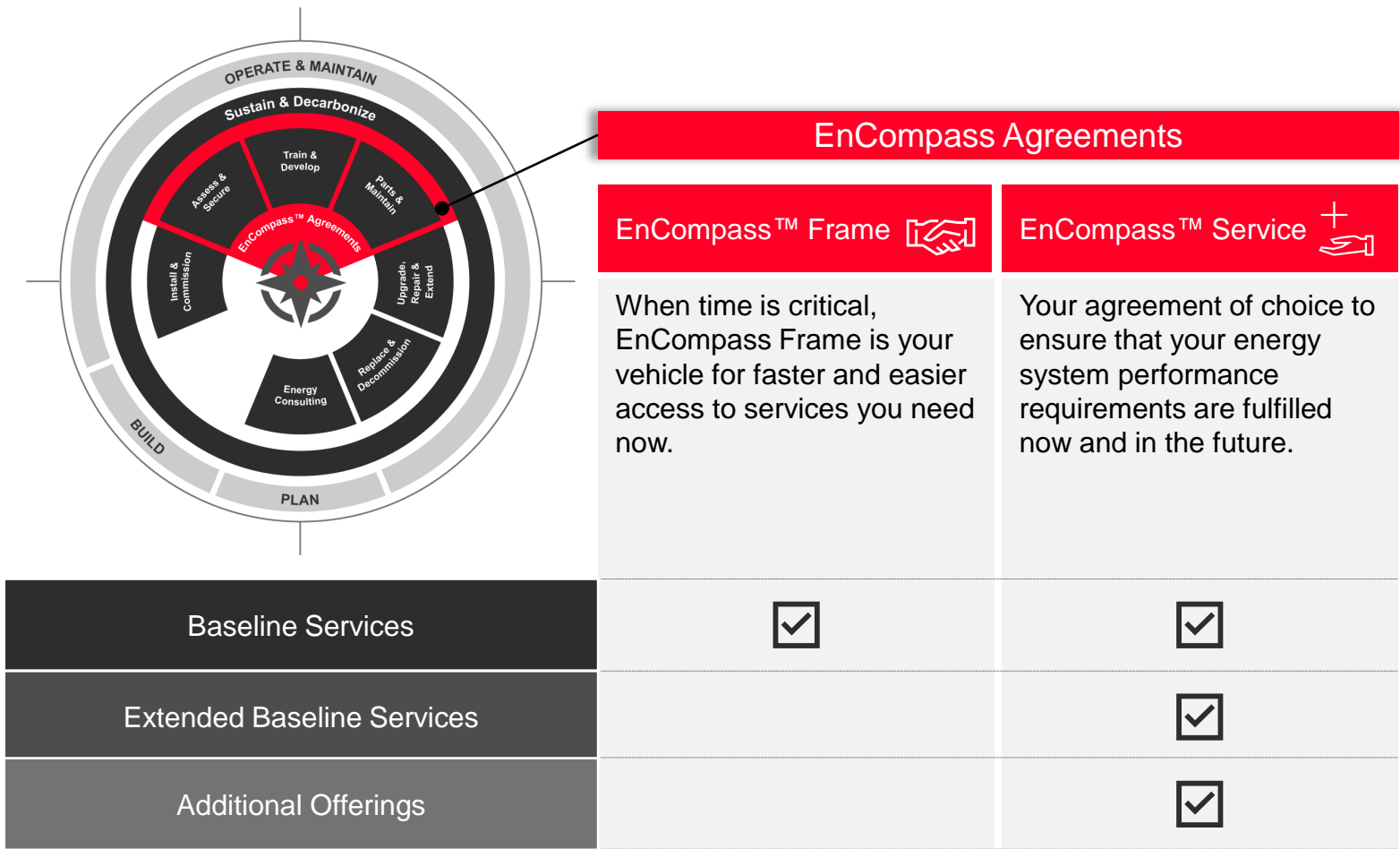
Designed with maximum flexibility to deliver your customized program to meet/exceed your energy system requirements



Continually leveraging our expertise in technology, sustainability, and resilience to realize your energy system of the future



We have the same goal – Your Success





Streamlined access to essential energy services

Components

Easy contracting and procurement

Terms & Conditions

A pre-agreed framework ensuring all our transactions run smoothly and swiftly, with no surprises.

Rates & Pricebook

Get access to clear, fixed hourly rates for any additional services, providing transparency and predictability.

Contract Manager

A dedicated expert is assigned to manage all your service agreement needs, ensuring personalized and efficient interactions.

Round-the-clock access to expert support

24/7 Customer Connect Center

Anytime access to our expert tech support team. Each request gets a unique reference for easy follow-up and quick resolution.



Benefits

- Accelerated response
- Simplified administration
- Financial security
- Established point of contact
- Continuous technical assistance



Customized premium support for your energy system performance

Components



EnCompass™ Frame Agreement components



On-Site Assistance

When you need us in person, our Hitachi Energy Technicians deliver fast On-Site help. Costs are transparent, based on service rates and spare parts availability.

Technical Remote Support

Benefit from immediate, professional help through phone or AR tools. Our yearly 'hour bank' gives free support, ensuring swift troubleshooting responses.



Shopping Cart of Additional Included Services

Flexibility is key. Choose additional services during your agreement period. Enjoy the freedom of choice with the assurance of stable pricing.



Assess & Secure



Train & Develop



Parts & Maintain



Benefits

- EnCompass™ Frame benefits
- Priority expert assistance
- Established On-Site response
- Single point of contract management
- Customizable services

Shopping Cart of Additional Included Services



Assess & Secure

Asset management services (i.e. RelCare™ - A tailored, long-term partnership that reinforces system reliability)

Condition assessment and planning for your assets

Cybersecurity assessment and management

EconIQ™ Implementation - To analyze the environmental impact of maintenance activities and projects

Site audit for substation system or specific assets

TXpert™ Ecosystem - For digitalization of transformers and data driven intelligence and decision making

Routine and specialized testing, non-destructive testing to validate the asset health

.... additional customizable service offerings available



Train & Develop

Cybersecurity consulting

Supplemental expertise to strengthen your internal / apprenticeship programs

Classroom, On-Site, or virtual training programs

HSE / Electric safety trainings

Continued staff development through real-time virtual (AR) tools connecting your staff with our experts

Protection and control system training program

Energy portfolio management consulting

.... additional customizable service offerings available



Parts & Maintain

Critical spare parts and inventory management programs

Established field service response time

Tailored and enhanced cybersecurity measures and responsiveness

Tailored sustainability solutions designed to surpass your maintenance requirements and environmental goals

Premium access to 24/7 Technical expertise

Tailor-made substation / asset maintenance offerings to match your programs

Full range of On-Site corrective services (basic to complex)

.... additional customizable service offerings available

Customize your agreement with Hitachi Energy extensive service offerings. Your agreement of choice to ensure that your energy system performance requirements are fulfilled now and in the future

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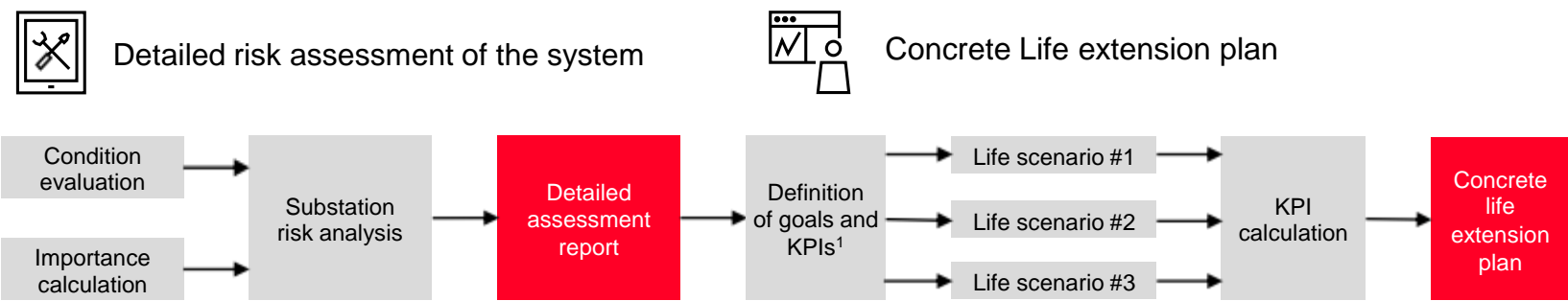
- Substation Assessment at Sasa Inti
- Service Level Agreement at IP Nusa Penida
- Strategic Planning for Transformers at Freeport

➤ Q&A

Substation Assessment to analyze the system and define a plan to improve its safety, reliability and sustainability

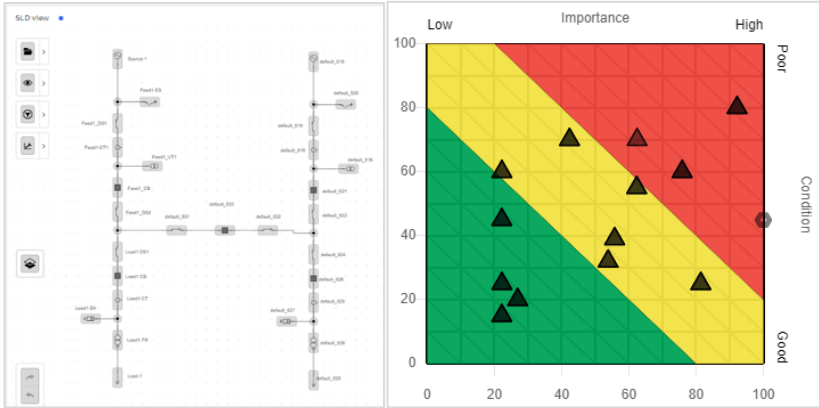
Hitachi Energy's Substation Assessment

SYSTEM LIFECYCLE: Operate & Maintain



Maintenance plan

- 1. **Comprehensive assessment:** development of risk matrix through identification of critical assets and assessment of their condition using advanced software and visual inspections
- 2. **Targeted recommendations:** specific recommendations to improve reliability, reduce risks, and optimize your system's performance
- 3. **Enhanced decision-making:** fact-based foundation for informed decision-making, enabling extension of system's lifespan and adoption of more sustainable practices



Background & Challenge

- Customer desire to upgrade their **30 years old substation** according with actual equipment condition and finance



Solution

- Carried out Substation Assessment 150kV S/S of 2 Transformer Bay.
- Provided recommendation for **system reliability and availability improvement** including:
 1. Asset priority list on their S/S.
 2. Detail recommendation activities for future action and what to do maintain action before future action conducted.
 3. Recommendation spare part list and support from technical team.

Impact

- Refined maintenance program.
- Step by step retrofit program on their S/S as per their finance program.

Background & Challenge

- Driven by new technology in PT PLN Indonesia Power's Plant installed by KSO SEI-Hitachi, Hitachi Energy is committed to maintain the performance of Nusa Penida PV-BESS Hybrid Plant within 2 years after commercial operation of the power plant.



Solution

- Battery Energy Storage System (BESS), including 9 Battery Rack with 3MW/1.84 MWh capacity and 3 Battery Inverter to support PV Smoothing application in 4.2 MW peak PV Power plant

Hitachi Energy Service:

- 2 years of service, providing:
- System performance test every 6 months to maintain the availability of the power plant
- Remote support for troubleshooting of BESS system
- BESS operational knowledge sharing
- BESS operational optional mode in peak load driven by Nusa Penida load demand increment



Transformer Repair

Restore the condition of transformers

Workshop and/or Site repair of :

- Large & medium power transformers
- Distribution & small power transformers
- Traction, core & shell transformers

400+ transformer repairs executed successfully in 35+ countries



Transformer Component Upgrade

Targeted refurbishment for improved performance

Extending the lifespan by **replacing the right key components**:

- Bushing replacement
- Tap changer upgrades & overhaul
- Transformer safety & measurement devices



Transformer Cooling (Power) Upgrade

Increase the MVA rating of transformer

- Recalculate **thermal performance** with modern FEM, CFD simulation tools to evaluate potential additional cooling capacity
- Increase the capacity by **adding or replacing radiators**, fans, pumps, or coolers during a planned outage



Fleet reliability-based maintenance plan

Do the right maintenance at the right time for the fleet

- **Assess full transformer fleet** to evaluate individual risk with Hitachi Energy's mature algorithms, and devise maintenance actions needed
- **Prioritize maintenance** actions according to urgency of activity and asset importance in system

Background & Challenge

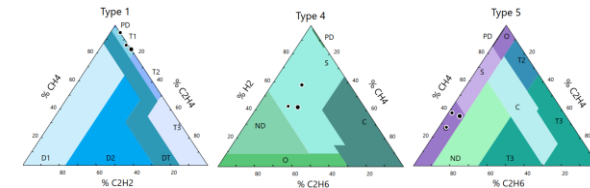
Over the life of a transformer, the asset will be subject to various conditional and environmental events from the power network.

These events can create unpredictability in the asset's performance and greatly increase risk of failure.



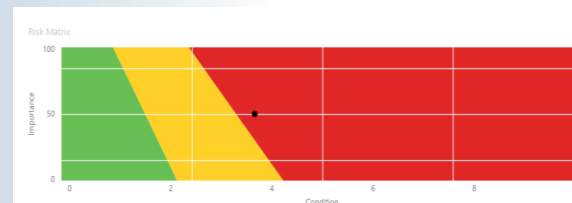
Solution

- Collect and input maintenance data for 40 units transformer
- Provide Detail recommendation activities for future action and what to do maintain action before future action conducted.
- Provide Transformer Asset priority list .



Impact

- Identifies risk early to prevent unscheduled transformer outages
- Make better maintenance decision
- Prioritize investment decisions





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