POM

A MEMBER OF PECC2

POWER PLANT OPERATION AND MAINTENANCE BRANCH

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CONTENTS

1 OVERVIEW

ABOUT POM

In 2018, with the success of PECC2 for nearly 40 years and to meet diverse needs in the energy industry, PECC2 established POM to develop a new business, namely Operation and Management for power plants. From the O&M experience in the first few power plants, POM has constantly developed and expanded services to the market such as maintenance, repair, upgrading, and improving performance not only for solar and wind power plants but also for thermal power plants. Hence, we proudly become one of the leading brands in the operation and management of power plants, substations, and transmission lines.

MILESTONES

23/06/2023
Rename
Power Plant Operation and Maintenance Branch

09/2021
O&M of the first Wind power plant

03/2021
O&M of the first Thermal power plant

03/03/2020
Establishment of Branch of
Power Plant Operation Management Center

10/2019
Inauguration of PECC2 Operation Control Center (PECC2-OCC)

01/04/2019
Establishment of Power Plant Operation Management Center

12/2018
O&M of the first Solar power plant

22/09/2018
Establishment of Power Plant Operation and Management Department

VISION

POM ceaselessly develops our business and scale intending to be the top partner in the O&M, electrical tests and upgrading of power plants, substations, and transmission lines in Vietnam and International.

MISSION

Providing services with the best quality, prestige and effectiveness to ensure the goals and maximize customer's benefit.

Always ameliorating operation procedures, modernizing technology to keep up with new trends and meet the demands of the competitive market.

Educating, training and enhancing competencies of our personnel; developing labor compensation and benefit to keep growing our human resources.

Bringing sustainable values for society and community.

CORE VALUE

- Cooperation
- Safe
- Effective
- Professional
- Innovative and creative

COMMITMENT

- Organizing and mobility of personnel to manage and operate power plants and transmission lines to meet required safety, availability and performance;
- Ensuring the operation of power plants and transmission lines in accordance with Authority regulations and guideline of manufacturers; handling in unexpected incidents of equipment for safe, reliable, and continuous operation.

HIGHLIGHTS

39
Power plant projects

#1
The first licenced PECC2 Operation Control Center (PECC2-OCC) in Vietnam

Over **420,000,000** kWh
are being generated every month

98% - 99%
of the average Availability Factor (AF) of our operating plants

Over **4,800** MW
in total operating capacity

0
Accident or violation of HSE regulations at power plants

Adwards

Company of the year: Operation & Maintenance 2021 & 2022

STRENGTH

Human resource:

- High quality, well-trained both domestically and internationally;
- Intense experience; attained required operation certificates; acknowledged operation regulations and procedures; in-depth knowledge of designs, equipment, and technology of power plants, substations, and transmission lines;
- Professional manner.

Experience:

- Inheriting experience from PECC2 through the process of consulting, monitoring, designing, constructing, and commissioning, etc, numerous projects, POM understands the technical characteristics, technological equipment, and specificities of each type of power plant;
- Operation & maintenance management for multiple projects with various types of power plants, thereby having a comprehensive database on different types of power plants to serve training and coaching;
- Mastering specialized regulations, planning information, laws, and regulations of relevant authorities.

Infrastructure:

- PECC2 Operation Control Center (PECC2-OCC) is one of the first Remote Operations Management Centers licensed in Vietnam in 2019;
- Modern laboratory certified by the General Administration for Measurement of Electrical and Electronic Activities;
- The simulation room simulates the operation of the biomass power plant with modern equipment and software to serve the training of the POM's operator team and the external partners;
- Analytics and assessment system for PV panels and PR of Solar power plants;
- Quality and modern machinery, tools, and equipment.

Certification:

JAS-ANZ QUACERT ISO 9001:2015

JAS-ANZ QUACERT ISO 14001:2015

JAS-ANZ QUACERT ISO 45001:2018

2 OUR CAPABITIES

Our Services
Infrastructure
Human Resources

OPERATION AND MANAGEMENT

Operation and Management for power plants:
- Thermal power plants
- Hydroelectric power plants
- Renewable power plans: Solar, wind, biomass

HI-TECH SERVICES

- Maintenance and Repair for Inverter
- Design and manufacturing for PV module cleaning
- Checking and restoring the installation of protection relays of substations and power plants
- Repair electrical equipment
- Research on manufacturing control structures and parts for industrial machines

TRAINING & COACHING

- Shift leader of Power Plant & 500kV Substation
- O&M for power plants and substations
- Safety Engineering and Health - Safety - Enviroment (HSE)
- Operation of the Thermal & Biomass Power Plant by simulation systems

OUR SERVICES

PROJECT CONSULTATION AND EVALUATION

- Project investment consultancy
- Consulting on licensing electricity activities and COD

MAINTENANCE, TESTING, AND EXPERIMENT

- Maintenance services for power plants, substations, power transmission lines, and industrial plants
- Testing and measuring power plant efficiency test
- Commissioning services

PROVISION OF TOOLS, EQUIPMENT, AND SPARE PARTS

- Supply of equipment, tools, and spare parts
- PV cleaning robot

PECC2 Operation Control Center (PECC2-OCC) is of a complex technology consists of cutting-edge hardware and software, which is in charges of collecting, processing data from plants, giving operators interactive interfaces to remotely monitor and control.

Labor-saving

By employing technologies and the internet, the entire activities of operation, monitoring, control, and interaction with A0 and A2 will be completely in the Center. Therefore, it forms the foundation for signisicantly reducing in-site personnel.

Simulation

With Human-Machine Interface (HMI) technology, our OCC operators are given a dashboard that simulates in-site control system. Therefore, they are able to operate power systems in a centralized manner with multi-user and different locations.

Data collecting

PECC2-OCC is competent to collect real-time data and effectively storage for a long term.

Data connection

PECC2-OCC is a very supportive system in stably, reliably, and continuously connecting data to other operation control centers, as well as SCADA systems of load dispatch centers.

Data security

The system is equipped with necessary solutions (Router, Firewall) to decentralize data access and security for outbound connections in accordance with NERC CIP.

Compatibility and extension

PECC2-OCC is eligible to for updating new functions without massive systematic or software changes.

The Simulator Operator Training System (OTS) of POM offers several outstanding advantages, including:

- High-Fidelity Simulators: Simulator OTS developed using the ProTRAX toolkit - aims at providing real-world experience during normal plant operation as well as in abnormal situations in terms of various stages of the power plant process;
- Safety: Simulator OTS allows Trainees to practice in a risk-free environment, Trainees can make mistakes and learn from them without endangering lives or causing damage to equipment;
- Cost-Effective Training: Simulator OTS reduces training costs by providing a virtual training environment when compared to training on real equipment;
- Remote Training: Simulator OTS can often be conducted remotely, allowing Trainees to access training materials and practice from anywhere;
- Realistic Scenarios: Simulator OTS can replicate real-world scenarios with a high degree of accuracy, with over 100 available "What-if" scenarios, malfunctions & emergencies, The Trainees can prepare for a wide range of situations, can repeat training scenarios as many times as needed to practice and achieve proficiency;
- Skill Development: Trainees can focus on honing specific skills or tasks, and handle emergencies without being distracted or pressured by real-time environments. Trainees can transfer the skills they acquire in the simulator directly to the real world, making them more effective and confident in their roles and capable of ensuring the smooth, safe & efficient operation of the power plant.

ELECTRICAL LABORATORY

POM pays special attention to maintenance, repair, and electrical testing while building an organizational structure and investing in human resources and equipment to improve the system and power plant operating efficiency.

POM has invested and built an Electrical Laboratory (Lab) with many modern equipment and has significant achievements such as:

- Designing and manufacturing PV cleaning Robots;
- Researching and repairing Inverters;
- Testing and repairing control devices, protective devices, etc;
- Maintaining and testing equipment of substation.

In addition to researching and repairing existing equipment, the electrical laboratory is used to test new equipment and technologies before being put into practical use.

PV CLEANING ROBOT

POM has successfully developed and tested an RP0XPV PV cleaning robot and put it into practical operation.

Advantages of RP0XPV Robot:

- A compact design can be placed on the surface of the battery panel and moved, automatically cleaning without damaging the battery panel structure;
- The length can be adjusted to fit specific conditions and up to 3 PV rows can be arranged in 2 different directions with a panel length of up to 6 meters;
- Remote operation up to 500 meters away.

The benefits of RP0XPV Robot:

- The investment cost of robots and auxiliary equipment is low;
- Save time and human resources;
- Save water and fuel;
- The cleaning efficiency exceeds 98%;
- Flexible and easy to use;
- Increase efficiency for solar panels.

HUMAN RESOURCES

Nearly 500 personnel

POM nearly has 500 high-quality people in our workforce, who were well-trained both domestically and internationally, as well as obtained operation certificates, well-informed about operation regulations and procedures. We're knowledgeable about designs, equipment, and technology of power plants, substations, and transmission lines by experiences from the designing and constructing process. Therefore, we're able to provide solutions to ensure the plants' readiness as well as effective and safe operation with maximized productivity.

We share a passion for serving customers, constantly developing ourselves to become important and reliable partners, bringing many benefits to both partners and customers.

Master 26

Engineer 219

Technician 172

Executive 24

Number of shift leaders: 173 personnel, in which:

Certified by National Load Dispatch Center (A0): 139 personnel, including:

- **86 shift leaders of solar power plant;**
- **03 shift leaders of hydropower plant;**
- **01 shift leader of thermal power plant;**
- **33 shift leaders of wind power plant;**
- **08 shift leaders of 500kV substation;**
- **28 shift leaders of OCC.**

Certificate of Regional Load Dispatch Center:

- **Northern (A1): 02 personnel;**
- **Central (A2): 07 personnel;**
- **Southern (A3): 16 personnel;**

Certificate of Provincial Power System Dispatching Center: 07 personnel.

3 PROJECT PORTFOLIO

Solar power plant projects

Wind power plant projects

Thermal power plant projects

TYPICAL PROJECTS

LIG Quang Tri Solar Power Plant
(49.5MWp)

Ia Pet - Dak Doa 1 & 2 Wind Power Plant
(200MW)

Yang Trung Wind Power Plant
(145MW)

Loc Ninh 1,2 & 3 Solar Power Plant
(550MWp)

Dau Tieng 1 Solar Power Plant
(180MWp)

Tan Thuan Wind Power Plant
(75MW)

Duyen Hai 2 Thermal Power Plant
(1,320MW)

Phong Điện II Solar Power Plant
(50MWp)

Hoa Hoi Solar Power Plant
(257MWp)

Thanh Long Phu Yen Solar Power Plant
(50MWp)

Van Phong 1 Thermal Power Plant
and 110kV & 500kV Power Plant Substations
(1,320MW)

BIM2 Solar Power Plant
and Quan The Switching Station
(325MWp)

Son My 3.1 Solar Power Plant
(50MWp)

LIST OF PROJECTS

No.	Project	Capacity	Location
SOLAR POWER PLANT			
1	Gio Thanh 1 & 2	100MWp	Quang Tri
2	LIG Quang Tri	49.5MWp	
3	Phong Dien II	50MWp	Thua Thien Hue
4	Hoa Hoi	257MWp	Phu Yen
5	Europlast Phu yen	50MWp	
6	Thanh Long Phu Yen	50MWp	
7	Trung Son	40MWp	Khanh Hoa
8	BIM2 & Quan The Switching Station	325MWp	Ninh Thuan
9	CMX	160MWp	
10	Thien Tan 1.2	100MWp	
11	Thien Tan 1.4	100MWp	
12	Ninh Phuoc 6.1 & 6.2	58.5MWp	
13	Thien Tan 1.3	50MWp	
14	Phuoc Ninh	45MWp	
15	Nhon Hai	25MWp	
16	Son My 3.1	50MWp	Binh Thuan
17	Song Luy 1	46.7MWp	
18	Mui Ne	40MWp	
19	VSP Binh Thuan II	30MWp	
20	Vinh Tan - Phase 01	5MWp	
21	Loc Ninh 1,2 & 3	550MWp	Binh Phuoc
22	Dau Tieng 1	180MWp	Tay Ninh
23	Dau Tieng 3	180MWp	
WIND POWER PLANT			
24	Ia Pet - Dak Doa 1&2	200MW	Gia Lai
25	Cho Long	155MW	
26	Yang Trung	145MW	
27	Tan Thuan	70MW	Ca Mau
28	Nhon Hoi	60MW	Binh Dinh
29	Khay Bac Lieu	40MW	Bac Lieu
30	Soc Trang 7	30MW	Soc Trang
31	Sunpro	30MW	Ben Tre
THERMAL POWER PLANT			
32	Duyen Hai 2	1,320MW	Tra Vinh
33	Vinh Tan 4 & Vinh Tan 4 Extension	1,800MW	Binh Thuan
34	Vinh Tan 1	1,240MW	
35	110kV & 500kV Van Phong 1 Power Plant Substations	1,320MW	Khanh Hoa


OUTSTANDING PROJECTS

LOC NINH 1,2 & 3 SOLAR POWER PLANT (550 MWp)

Location: Binh Phuoc Province
Owner: Super Energy Corporation Public Company Limited (Thailand)
Scope of work: O&M services for the Power Plant and 220kV Substation; Grass cutting and PV cleaning
Service provision period: From December 2020 to present

BIM2 SOLAR POWER PLANT AND QUAN THE SWITCHING STATION (325 MWp)

Location: Ninh Thuan Province
Owner: BIM Renewable Energy Joint Stock Company (BIM Group)
Scope of work: O&M services for the Power Plant and 220kV Substation; Grass cutting and PV cleaning
Service provision period: From April 2023 to present

HOA HOI
SOLAR POWER PLANT
(257 MWp)

Location: Phu Yen Province
Owner: Phu Yen TTP Joint Stock Company - B.Grimm Group (Thailand)
Scope of work: O&M services for the Power Plant and 220kV Substation; PV cleaning
Service provision period: From June 2019 to present

DAU TIENG 1 SOLAR POWER PLANT (180 MWp)

Location: Tay Ninh Province
Owner: DT1 Energy Joint Stock Company (Xuan Cau Holdings)
Scope of work: O&M services for the Power Plant
Service provision period: From July 2022 to present

GIO THANH 1&2 SOLAR POWER PLANT (100 MWp)

Location: Quang Tri Province
Owner: Gio Thanh Energy Joint Stock Company and SECO Joint Stock Company
Scope of work: O&M services for the Power Plant and 22/110kV Substation; Grass cutting, PV cleaning, and security service
Service provision period: From December 2020 to December 2022

THIEN TAN 1.4 SOLAR POWER PLANT (100 MWp)

Location: Ninh Thuan Province
Owner: Ninh Thuan Energy Industry Joint Stock Company (T&T Group)
Scope of work: O&M services for the Power Plant and 220kV Substation; Grass cutting and PV cleaning
Service provision period: From August 2023 to present

PHONG DIEN 2 SOLAR POWER PLANT (50 MWp)

Location: Thua Thien Hue Province
Owner: Doan Son Thuy Investment Joint Stock Company
Scope of work: O&M services for the Power Plant and 110kV Substation; Grass cutting, PV cleaning, and security service
Service provision period: From November 2020 to present

EUROPLAST PHU YEN SOLAR POWER PLANT (50 MWp)

Location: Phu Yen Province
Owner: SP Group (Singapore)
Scope of work: O&M services for the Power Plant and 110kV Substation; Grass cutting, PV cleaning, and security service
Service provision period: From April 2023 to present

SONG LUY 1
SOLAR POWER PLANT
(46.7 MWp)

Location: Binh Thuan Province
Owner: Binh Thuan Solar Power Investment Joint Stock Company
Scope of work: O&M services for the Plant, 110kV Substation, 110kV Switching Station; PV cleaning
Service provision period: From May 2020 to present

MUI NE
SOLAR POWER PLANT
(40 MWp)

Location: Binh Thuan Province
Owner: Duc Thanh Mui Ne Joint Stock Company (Dragon Capital)
Scope of work: O&M services for the Power Plant and 110kV Substation; Grass cutting, PV cleaning, and security service
Service provision period: From February 2022 to present

NHON HAI SOLAR POWER PLANT (35 MWp)

Location: Ninh Thuan Province
Owner: Licogi 16 Solar Energy Joint Stock Company (Banpu Public Company Limited)
Scope of work: O&M services for the Power Plant and 110kV Substation; Grass cutting, PV cleaning, and security service
Service provision period: From February 2022 to present

IA PET DAK DOA 1&2 WIND POWER PLANT (200 MW)

Location: Gia Lai Province
Owner: Ia Pet Dak Doa Wind Power Plant Number 1 & Number 2 Joint Stock Company (TRE Group)
Scope of work: O&M services for 500kV and 220kV Substation; 500kV, 220kV, and 35kV Transmission line, and wind turbine
Service provision period: From July 2022 to present

CHO LONG WIND POWER PLANT (155 MW)

Location: Gia Lai Province
Owner: Cho Long Wind Power Joint Stock Company (Hoang Son Group)
Scope of work: O&M services for the Power Plant and Substation; Other supportive services
Service provision period: From December 2021 to present

YANG TRUNG WIND POWER PLANT (145 MW)

Location: Gia Lai Province
Owner: Yang Trung Wind Power Joint Stock Company (Hoang Son Group)
Scope of work: O&M services for the Power Plant and Substation; Other supportive services
Service provision period: From October 2021 to present

TAN THUAN WIND POWER PLANT (75 MW)

Location: Ca Mau Province
Owner: Ca Mau Investment Renewable Power Joint Stock Company
Scope of work: O&M services for Transmission line, Substation and wind turbines
Service provision period: From October 2021 to present

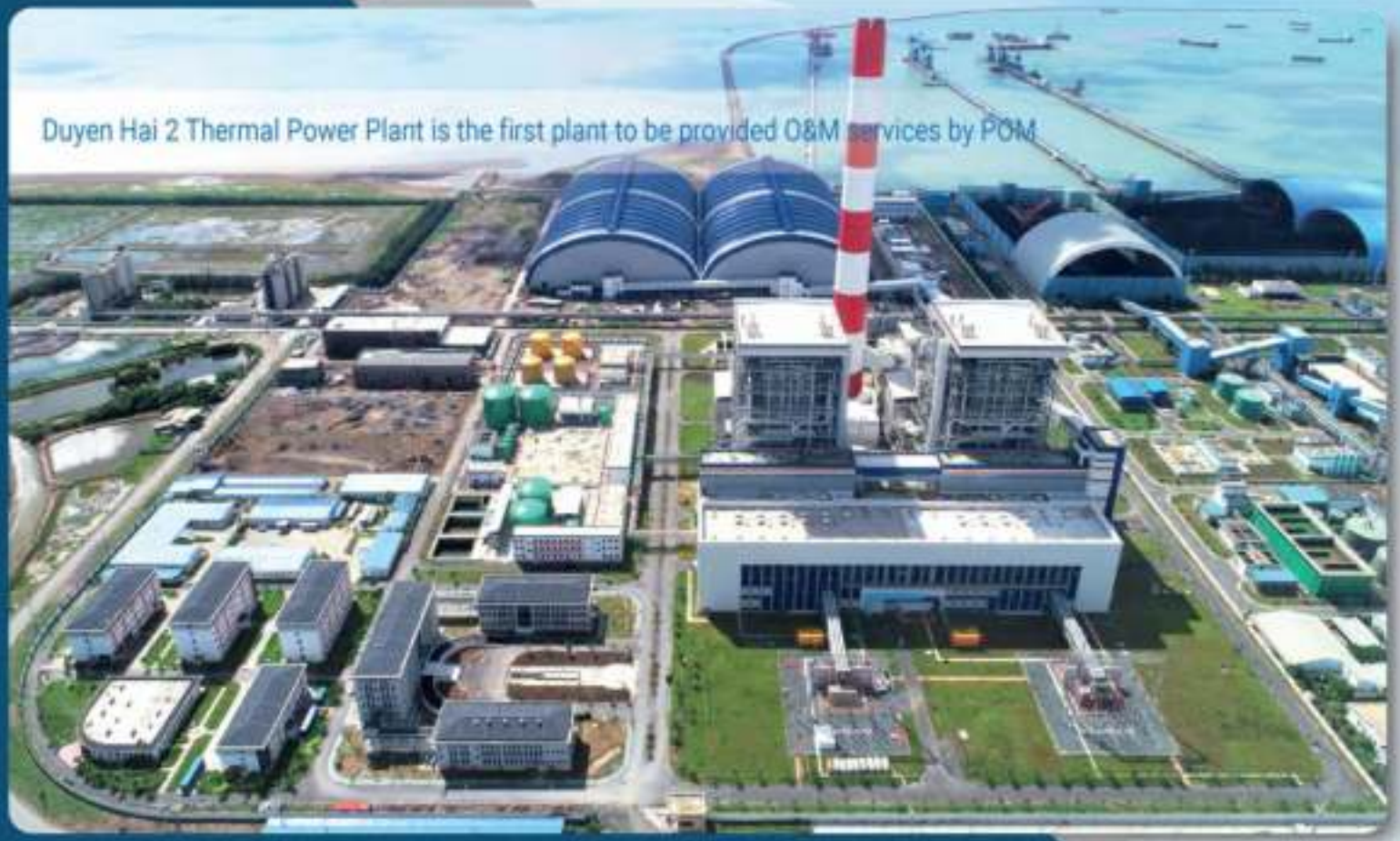
KOSY BAC LIEU WIND POWER PLANT (40 MW)

Location: Bac Lieu Province
Owner: Bac Lieu Kosy Wind Electric Joint Stock Company (Kosy Group)
Scope of work: O&M services for Substation and Transmission line
Service provision period: From September 2021 to September 2022

NO 7 SOC TRANG WIND POWER PLANT (30 MW)

Location: Soc Trang Province
Owner: Soc Trang Energy Joint Stock Company
Scope of work: O&M services for 110kV Substation and Transmission line
Service provision period: From December 2021 to October 2023

DUYEN HAI 2 THERMAL POWER PLANT (1,320 MW)



Location: Tra Vinh Province
Owner: Janakuasa Vietnam Limited (Janakuasa Sdn Bhd Group - Malaysia)
Scope of work: Operation service for AHS and CHS
Service provision period: From March 2021 to present

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VINH TAN 4 (1,200 MW) & VINH TAN 4 EXTENSION THERMAL POWER PLANTS(600 MW)

Location: Binh Thuan Province
Owner: VIETNAM ELECTRICITY - EVN
Scope of work: Testing and maintaining ESP, FGD, CHS, CAS, cooling water intake and discharge channels; Water treatment and wastewater treatment in the construction and warranty phases
Service provision period: From 2018 to 2021

110KV AND 500KV SUBSTATIONS OF VAN PHONG 1 BOT THERMAL POWER PLANT (1,320 MW)

Location: Khanh Hoa Province
Owner: Van Phong Power Company Limited (Sumitomo Corporation Group - Japan)
Scope of work: Commissioning services and O&M services for 110kV and 500kV Substations
Service provision period: From May 2022 to present

4 PARTNERS & CLIENTS

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