

Aravinthraajan Energy Systems Private Limited (AESPL)

Engineering the Energy Transition: A Decade of Impact



Since 2015

We are Specialist Partners in the Global Energy Transition

For 10 years, AESPL has served as a specialist partner for the global energy transition, integrating deep engineering expertise with strategic foresight to deliver complex decarbonization projects.

Mission

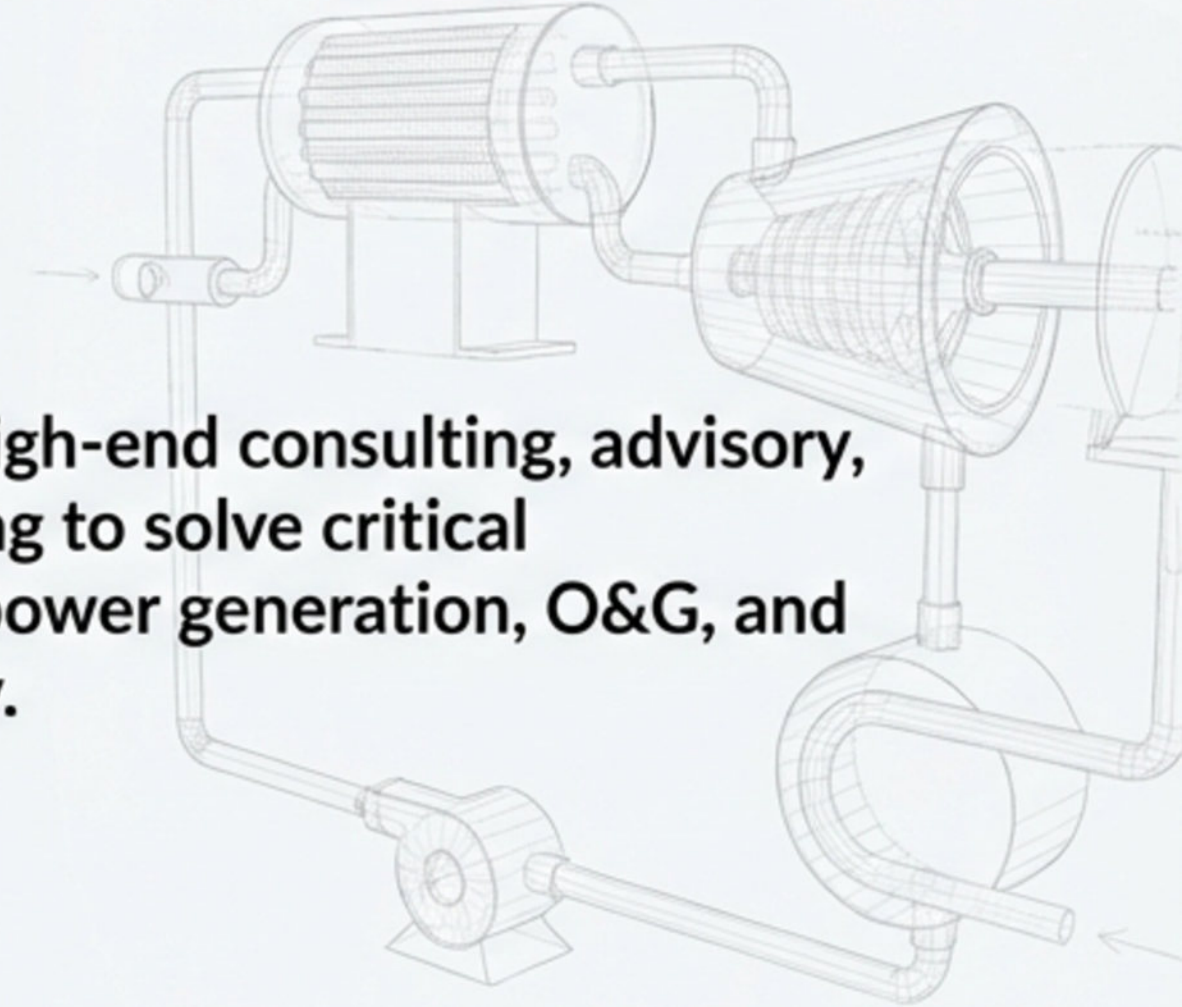
To provide climate change mitigation solutions for decarbonization and sustainability goals, driving progress toward Net Zero and ESG compliance.

Approach

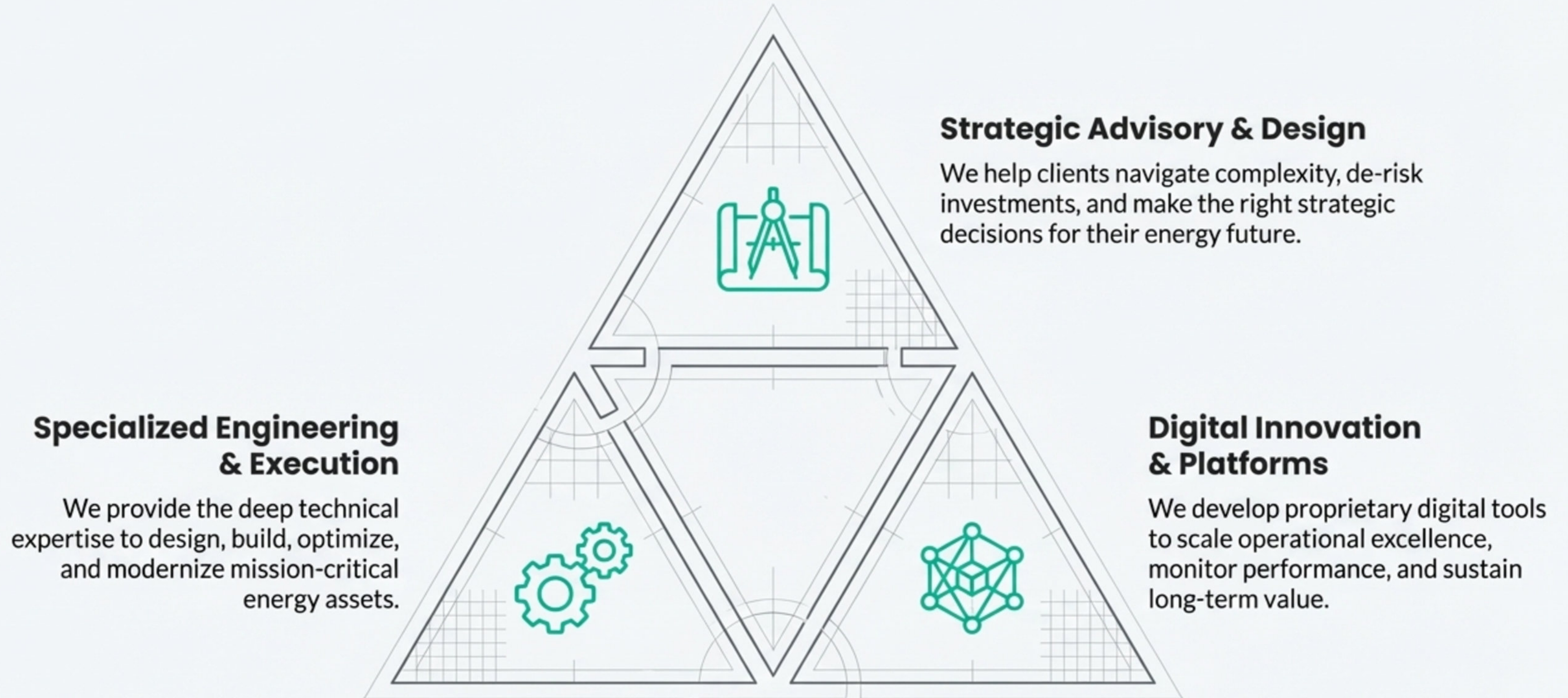
We combine high-end consulting, advisory, and engineering to solve critical challenges in power generation, O&G, and heavy industry.

Focus

Our expertise spans Clean & Green Energy sources, including LNG, Natural Gas, Hydrogen (H₂), Ammonia (NH₃), Waste Heat Recovery, and Biomass.



Our Integrated Approach to Delivering Value





Pillar 1: Strategic Advisory & Design

Navigating Complexity and De-Risking the Future of Energy





From Feasibility to Finance, We Provide End-to-End Strategic Guidance

Key Services

- **Feasibility & Detailed Project Reports:** Comprehensive techno-economic analysis for greenfield and brownfield projects.
- **Owners & Lenders Engineering:** Assisting banks and financial institutions in assessing and funding complex energy and infrastructure projects.
- **Fuel Conversion & Modernization Studies:** In-depth analysis for transitioning existing assets to cleaner fuels like Hydrogen.
- **Technology & Strategy Consulting:** Acting as Subject Matter Experts for clients navigating new technologies and regulations.

Proof Points

Case 1: Hydrogen Fuel Conversion Study for ExxonMobil (Fawley Refinery, UK)

Challenge: Assess the viability of converting two 500 tph boilers from oil/refinery gas to 100% Hydrogen firing.

AESPL's Contribution: Performed detailed thermal modeling and fuel conversion analysis to define the path to decarbonization and emission reduction.



Case 2: Flare-to-Power Feasibility for PERTAMINA (via KBR, Indonesia)

Challenge: Develop a strategy to utilize refinery flare gas for valuable power and steam generation.

AESPL's Contribution: Prepared a comprehensive feasibility study for a Combined Cycle Cogeneration plant, creating a business case for 10 MW of power and 25 tph of steam.





Pillar 2: Specialized Engineering
& Execution

**Delivering
Mission-Critical
Projects with
Precision and
Expertise**

We Engineer Advanced Solutions for Waste Heat Recovery and Power Generation

We support global OEMs and end-clients in designing and executing Waste Heat Recovery systems, leveraging both **Steam Rankine Cycle (SRC)** and **Organic Rankine Cycle (ORC)** technologies.

Project Showcase

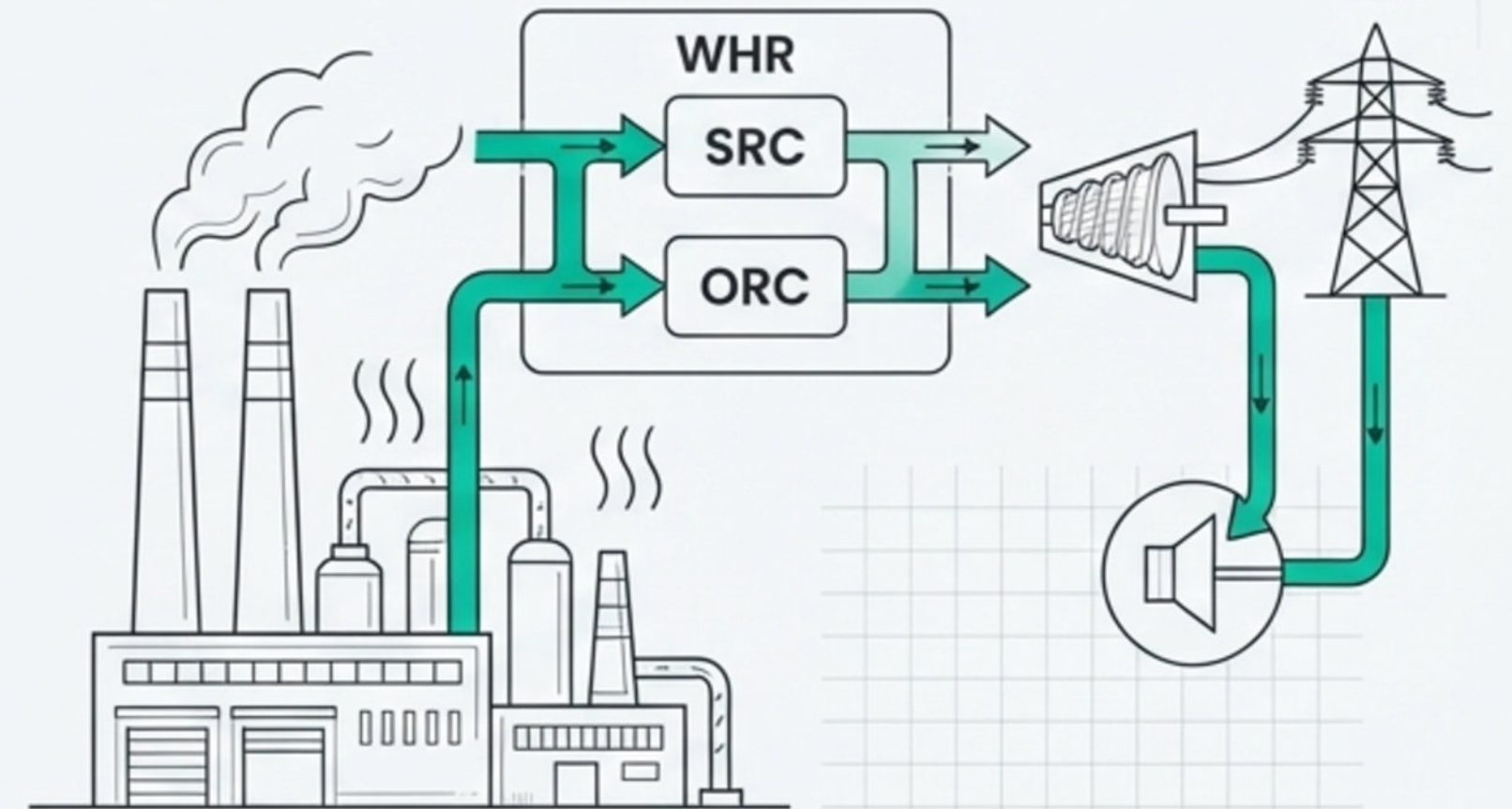
Shree Cement | India: Engineered Cement Waste Heat Recovery Boilers for a **11.45 MW ORC Power Plant**.

Riyadh Cement Company | KSA: Delivered engineering for a **14.25 MW ORC-based Waste Heat Recovery Power Plant**.

Titan Cement Company | Greece: Designed Cement Waste Heat Recovery Thermal Oil Heaters for a **10.0 MW ORC power plant**.

Irish Cement | Ireland: Provided engineering for Cement Waste Heat Recovery Thermal Oil Heaters for a **6.8 MW ORC power plant**.

Glass & Engine Industries: Executed WHR projects for clients including Borosil, Gold Plus Group, Wartsila, and TAQA Power.





Our Expertise Extends Across Renewables, Advanced Boiler Systems, and Emission Control



Renewable & Bio-Energy

Flagship Project: Engineering consultant for a **40 MWe Biomass (King Grass) fired IPP** for VILLAGE CORPS in Ghana, featuring BioGas co-firing and BioCNG generation.



OEM Engineering Support

Expertise: Proposal and detailed engineering for Water Tube & Fire Tube Boilers and Heat Recovery Steam Generators (HRSGs) for Gas Turbine plants.

Fuels Handled: Natural Gas, H₂ Gas, Refinery Off-Gases, and other process gases for major Korean EPCs (Hyundai, Samsung, Daewoo).



Emission Control & Retrofitting

Services: Subject Matter Experts for De-Dust (ESP/Bag Filters), De-NO_x, and De-SO_x (FGD) systems.

Proof Point: Executed a Wet Scrubber project for a 18 MW Biomass plant in the Philippines to meet stringent environmental compliance requirements.



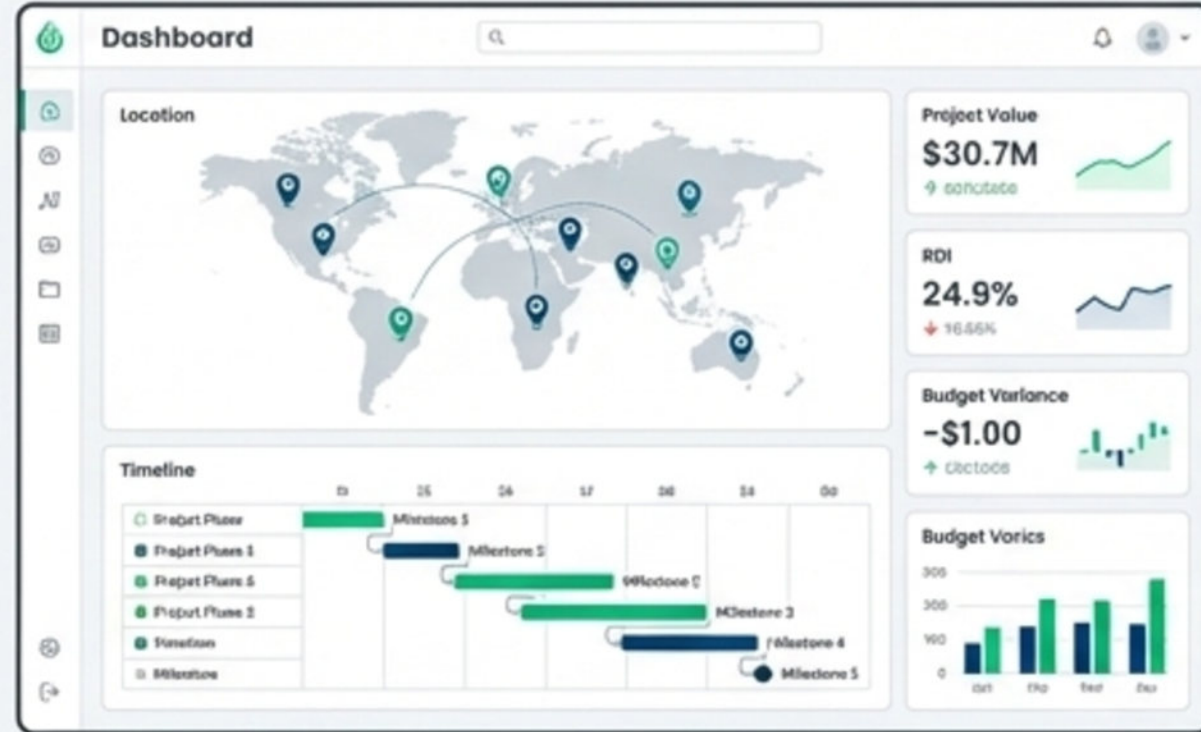
Pillar 3: Digital Innovation & Platforms

Building the Digital Tools to Scale and Sustain Performance



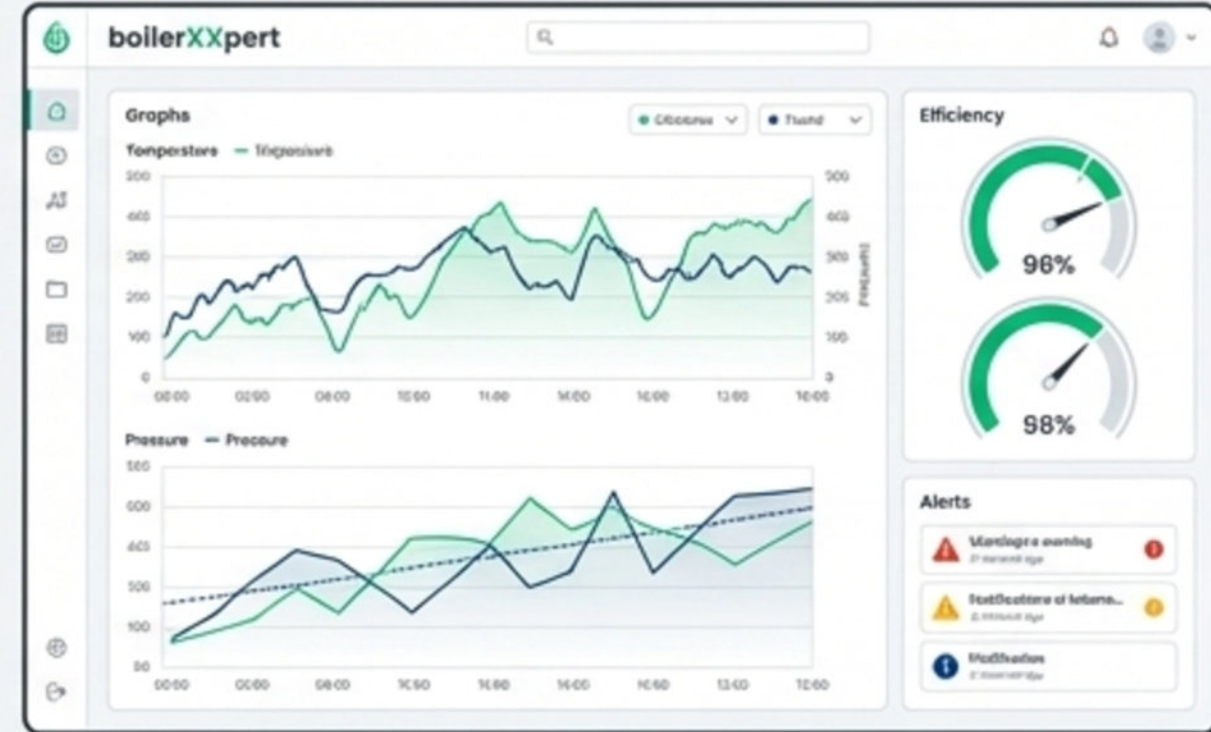
Pillar 3

We Develop Proprietary Platforms for Enhanced Operational Excellence



cGEM (Clean Green Energy Mission)

A web-based platform providing integrated engineering and financial solutions to support the development and operation of clean and green power generation projects.



boilerXXpert

A web-based utility for real-time performance monitoring and evaluation of industrial and utility boilers, enabling operational excellence and enhanced cost control.

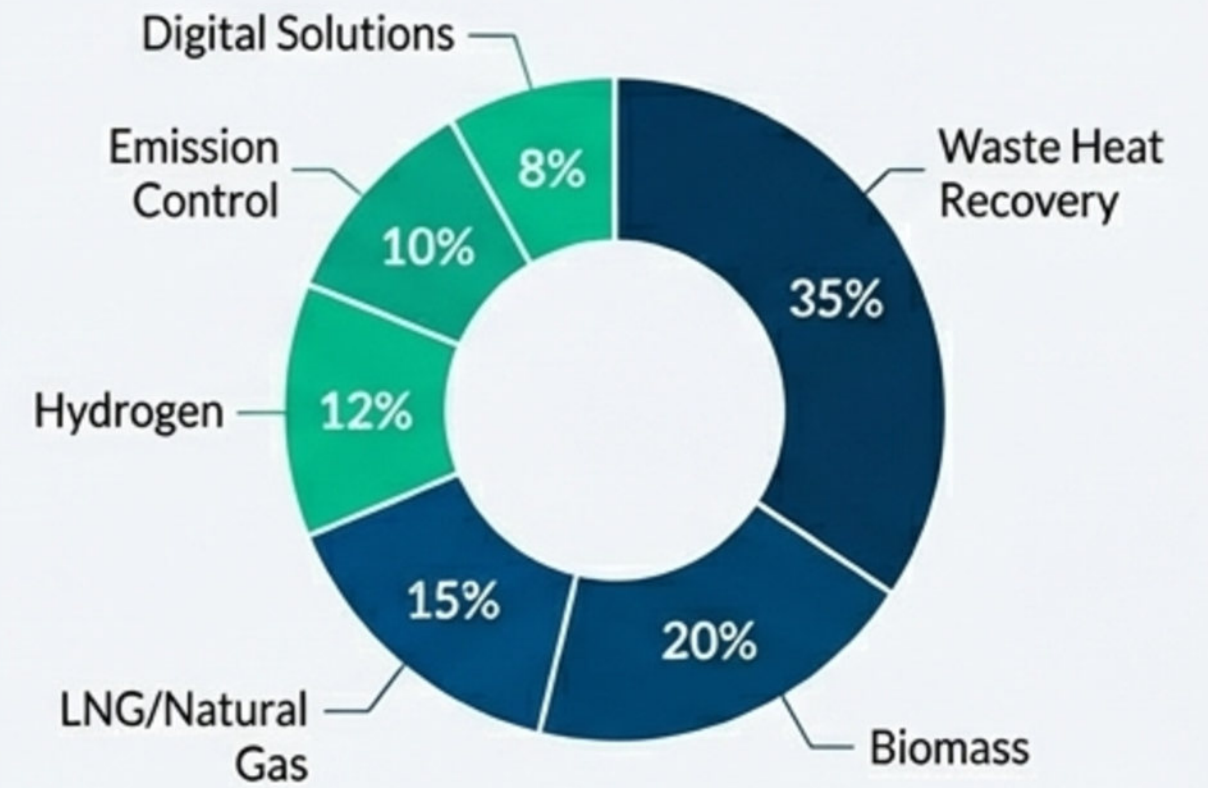
Underlying Capability: Custom Software Solutions

We develop bespoke web and Windows-based software for system and equipment-level simulation. This includes performance modeling for Boilers, HRSGs, Steam & Gas Turbines, Condensers, Heat Exchangers, and complete power plant cycles (Cogeneration, Combined Cycle, ORC).

Our Track Record: Delivering Complex Projects Across Geographies and Technologies



Diverse Technology Portfolio



Our experience combines global reach with deep, multi-faceted technical knowledge.

Trusted by Industry Leaders, Global EPCs, and Strategic Partners

Global Industry Leaders & Innovators

villagecorps



BOROSIL[®]

slc Shree
Cement

ExxonMobil

 **PERTAMINA**

Leading EPCs & OEMs

Keemurai (A/c-KBR)

NAV SAR
Navsar Engineering
(A/c-MATELEC)


WARTSILA

 **GREENS**
POWER EQUIPMENT


**AQUATHERM ENGINEERING
CONSULTANTS (INDIA) PVT. LTD**

 **THERMODYNE
TECHNOLOGIES**

Strategic Consultants & Financial Institutions

**McKinsey
& Company**

 **EY** Parthenon

A Decade of Impact: Our Comprehensive Capabilities



Strategic Advisory & Design

- Feasibility & Detailed Project Reports
- Owners & Lenders Engineering
- Techno-Economic Analysis & Financial Modeling
- Subject Matter Expertise for Decarbonization
- Fuel Conversion & Plant Modernization Studies



Specialized Engineering & Execution

- EPCM Support & O&M Optimization
- WHR Systems (SRC & ORC) for Cement, Glass, Steel
- OEM Support (Boilers, HRSGs, Turbines)
- Renewable Energy: Biomass, Waste-to-Energy
- Emission Control: De-SO_x, De-NO_x, De-Dust
- Plant Diagnostics & Troubleshooting



Digital Innovation & Platforms

- cGEM Platform for Clean Energy Projects
- boilerXXpert for Performance Monitoring
- Custom Software for System & Equipment Simulation
- Integrated Engineering Calculation Tools



Our Commitment to the Next Decade of Energy Transition

As the energy landscape evolves, so will we. Our next decade will be defined by a relentless focus on:

- ✔ **Advancing Hydrogen & Green Fuels:** Continuing to pioneer engineering solutions for H₂, Ammonia, and other next-generation energy carriers.
- ✔ **Deepening Digital Integration:** Expanding our digital platforms to create smarter, more efficient, and autonomous energy systems.
- ✔ **Forging Strategic Partnerships:** Collaborating across the ecosystem to accelerate the deployment of clean technologies and achieve global sustainability goals.



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Aravinthraajan Energy Systems

ReNew the World with Clean & Green Power

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