

# **Aan Energies Private Limited**





## INTRODUCTION

Aan Energies Private Limited (AEPL), a business enterprise focusing on green energy and clean water, is actively pursuing its business interests in delivering utility scale and commercial power projects, and is recognized as having the real-time experience that makes all the differences, when it comes to renewable energy projects.

AEPL is currently developing, building and financing various projects with a total capacity of about 25 MW. Our experience includes projects from commercial – large and small scale, municipal, educational and utility-scale customers.

AEPL is seeking to enhance its reach and develop new bases in the following energy domains: (a) Water and Wastewater Treatment, (b) Solar Power, (c) Wind Energy, and (d) Energy Efficiency and Sustainability. AEPL develops, builds, finances, operates and maintains turnkey projects of above mentioned projects for our customers. Currently AEPL is promoting businesses in India and look forward to expanding its operations worldwide.

## **EXPERTISE AND CAPABILITIES**

AEPL works with global resources in multidisciplinary fields and is equipped with up-to-date technologies and front runners in their specialized area of work. AEPL's strength is that, it has comprehensive solutions from **Concept-to-Commissioning**. Following are our areas of expertise:

## **Solar Power**

Solar power is the fastest growing renewable energy source globally. When it comes to solar project development, project financing, construction and operation of solar photovoltaic (PV) installations, and solar panel racking installations, AEPL has real-world and real-time experience that makes all the difference. Our solar power projects are guaranteed to succeed, and so do our customers' fortunes.

AEPL delivers end to end solar PV systems and services needed for solar installation under one roof. We provide complete end-to-end solutions from conceptualization to completion, including evaluation, feasibility study,

financing, design, engineering, supply, installation, commission, operation and maintenance of solar PV systems. AEPL offer a wide range of solar energy options and turnkey solutions comprising:

- Solar PV grid connected megawatt projects with c-Si, CdTe and CIGS technology
- Solar roof top power plants
- Solar building integrated power plants
- Off-grid solar photovoltaic power plants and remote village electrification
- Solar water pumping systems, and
- Solar water heating systems.



We combine our global experience with local focus to deliver seamless solar project management approach. AEPL is currently developing, building and financing solar PV projects with a total capacity of more than 15 MW. Our solar energy experience includes commercial projects for large and small scale, municipal, educational and utility-scale customers. We strongly believe solar energy can make a difference in energy cost control, energy independence and long term sustainability.



## **Wind Energy**

Wind energy is one of the fastest growing major sources of electricity around the world. Many countries prefer and promote wind energy due to its cost-effectiveness and environmental friendliness. AEPL provides a complete range of services from land sourcing to commercial operation including project planning, procurement, construction, and operation & maintenance of wind energy projects.

AEPL has helped its clients in implementing the solar-wind hybrid systems for providing uninterrupted power supply to some of the remote areas in the country.



## **Energy Efficiency and Sustainability**

Over 90% of energy that we use today comes from non-renewable sources such as coal, oil, and natural gas. The supply of such fuel is limited and yet the demand continues to rise. If we use energy more efficiently and at the same time increase the sourcing of alternative and renewable resources, we can reduce our energy costs, besides helping achieve the following:

- Saving our natural resources and preserving our environment
- Reducing carbon emissions, smog and global warming
- Preventing oil spills and acid rain.

Saving energy is not a burden, but an investment. The fundamental goal of energy conservation and management is to produce goods and provide services with the least cost and least environmental effect. We feel obligated to advocate the efficient use of energy resources through implementation of energy efficient and/or renewable energy technologies and to reduce the carbon foot print of industries and commercial establishments. We have vast experience in providing consultancy services and conducting energy audits in multifarious industries and commercial establishments. Our consultants have also been trained on advanced techniques in energy conservation and management for manufacturing & process industries and power utilities overseas.

AEPL also facilitates the business enterprises (manufacturing facilities, commercial buildings or any establishments, where energy is used) to set up energy and asset data management system, an enhanced energy management system (EEMS), for Web based data acquisition and report generating system. The EEMS system provides a centralized power monitoring and control facility. Web based software architecture enables the user to view online or offline data and generate reports.

#### **Water and Wastewater Treatment**



Water is the prime resource essential for survival of human life on earth. All ecosystems and habitats owe their existence to water. While 67% of the planet earth is geographically covered by water, fresh water is only 2.7% of it. Industrial activates and urban growth has increased the strain on fresh water. Hence, Sustainable water management throughout the world is fast becoming a necessity with the looming crisis over water resources threatening the security and livelihood of our ecosystem. Governments across the world are making the provision for clean water to their people by allocating large scale budgets and subsidy programmes.

AEPL believes India require a wide range of water and wastewater treatment systems in order to tackle the above challenges. As a leader in supply of water purification and wastewater treatment systems, with a focus on water reuse and Zero Liquid Discharge, AEPL is uniquely positioned to offer complete range of integrated water and wastewater management solutions.

AEPL has a dedicated team of engineers, technicians and administrators, who have a long history of treating water supplies and wastewater effluents, and are trained in their respective fields to provide superior quality products and unmatched customer services. With our vast experience in the water industry, we can offer a wide variety of systems and solutions to combat the ever increasing pure water demand for drinking and industrial applications, and can address environmental concerns related to sewage and effluent water treatment.

The company is committed to using its collective knowledge, experience and expertise to develop products, systems and services, which come from on-going R&D of process and control, manufacturing technology and colloidal chemistry. AEPL is providing most reliable and cost effective products that meet clients' satisfaction. With offices, representative and dealers' presence in all parts of the country, AEPL can meet its clients' requirements competitively and efficiently.

AEPL provides water treatment systems/ products on EPC, BOO and BOOT basis for the following:

- Arsenic, fluoride, iron & nitrate removal water treatment systems (with/without solar powered system)
- Reverse osmosis (RO) water treatment system
- Potable and industrial process water systems
- Sewage and effluent water treatment systems including zero liquid discharge



#### Reverse Osmosis Plant

The natural phenomena of the passage of low concentrated solute towards the high concentrated through a semi permeable membrane is called Osmosis. Reversing this principle by applying pressure on the high concentrated side and passing the solute (here water) through the semi permeable synthetic membrane is called Reverse Osmosis (RO).



Knowing the quality standards, experience and sourcing capabilities allow us to bring in best-in-class products with latest technology right to the doorstep of our customers. Our range of products is suitable for potable water plants, industrial requirements, hospitals, institutions, canteens, hotels and restaurants.

The standard models are available from 250 liters of treated water per hour up to 10,000 liters per hour. We have the tailor made RO systems up to 300,000 liters per hour capacity. The recovery of these RO systems ranges from 15–70% depending on raw water quality and the quality requirement of treated water.

## **Softener Plant**

The presence of scale forming salts of Calcium and Magnesium in water is called as hard water. Removing or replacing these salts to non-scale forming salts is called the process of softening. We employ the ion exchange method using the synthetic polystyrene resins to replace the Calcium and Magnesium salts in to non-scale forming Sodium salts, which are soft while heating.

We manufacture the softener according to clients' requirements. Few of the applications are (a) boiler feed water, (b) laundry applications in hotels and hospitals, (c) cooling tower make-up water for air conditioning and power plants, and (d) soft drinks and other drinks manufacturing plants.

The standard models are available both in FRP (fibre reinforced plastic) and MSEP (mild steel epoxy painted) from 250 liters per hour of treated soft water up to 1,000,000 liters per hour.

# **Demineralization Plant**

Demineralization (DM) produces the water free of minerals (i.e., dissolved solids). Two types of DM plants are available commercially, i.e. two bed demineralizer and mixed bed demineralizer.

Two Bed Demineralizer: Two bed demineralizer plants comprise Cation and Anion exchange columns operating in series. The Cation column converts all dissolved solids in raw water to acids. These acids are then removed as the water passes through the Anion column. When exhausted, the Cation exchange resin is regenerated with acid and the anion exchange resin with alkali.

A degasser tower is incorporated between the Cation and Anion columns to remove the carbonic acid formed due to breakdown of alkalinity by Cation exchange. In degasser tower, low pressure



air is introduced at the bottom of the tower, which scrubs out  $CO_2$  from the water sprayed down on a column of packing in the tower.

Mixed Bed Demineralizer: In a mixed bed plant Cation exchange resin and the strong base Anion exchange resins are mixed together. Water passing through this column comes in to contact with these materials repeatedly and is thus subject to an almost infinite number of demineralizing stages. By this method, demineralized water of extreme purity is produced, that cannot be produced by any other commercial process. The applications of these plants are where the treated water quality is critical, like high pressure boilers in power generation, pure and high pressure steam required in sugar factory and in the process of IV fluid manufacturing, etc.

AEPL has capacity to supply both two bed demineralizer and mixed bed demineralizer plants in all sizes from small portable units for laboratories to large multiple installations for power stations and fertilizers factory.



#### **Effluent Treatment Plant**

Unprecedented growth of industries especially of chemicals and allied products has resulted in degradation of environment. It has largely contributed to air, water, and noise pollution, which in turn adversely affects the human health, animals and vegetation. Each industrial effluent has different characteristics because of their process and chemicals used in the process. AEPL can economically design and supply effluent treatment plants for the following industries irrespective of the characteristics of effluent and the quantity discharged.

- Metallurgical industries (Zinc, Lead, Copper, Aluminum and Steel)
- Pulp and Paper
- Pesticides and insecticides
- Refineries
- Fertilizers
- Paints and dyes
- Leather tanning
- Rayon and textiles
- Basic drugs and pharmaceuticals
- Sodium and potassium cyanide
- Foundry
- Storage batteries
- Acids and alkalis
- Plastic and synthetic rubber
- Cement and asbestos
- Fermentation industry
- Electroplating industry.





# Sewage Treatment Plant

Domestic wastewater from kitchen, bathroom and toilet harm the environment heavily. Particularly, chemical oxygen demand (COD), biological oxygen demand (BOD) and suspended matters present in the wastewater will kill the aquatic life, when discharged without treatment. AEPL has developed sewage treatment plants (STP) in packaged models as well as customary civil construction models ranging from 5 KLD up to 500 KLD. Higher capacity plants are supplied mostly with civil construction. We supply STP for residential apartments, hotels, restaurants, resorts and industries.

# Other Water Treatment Systems

Fluoride Removal: Fluoride is essential for our body up a level of 1 mg/l in drinking water. When its concentration goes beyond this level, it affects our body. The disease called 'fluorosis' is caused mainly due to excess fluoride in drinking water. The crippling of hands and legs, deformity in bone and joints, loss of teeth and coloring of teeth are the common causes by this disease. In southern India, the following areas are found to be having high fluoride content in the ground water:

- Dharmapuri and Krishnagiri districts of Tamilnadu.
- Kolar, Chikkabellapur, Tumkur and Davangere districts of Karnataka.
- Chittoor, Anadapur, Nalgonda and Kadappa districts of Andhra Pradesh.

To treat the fluorides, two methods are predominantly followed. These are,

<u>Activated Alumina Process:</u> The water to be treated is passed through a column of activated alumina. The fluoride is adsorbed by the media. The process goes on till the activation presents in the system. Upon exhaustion, the media is regenerated with acid and alkali, and now it is ready for further use.

<u>Reverse Osmosis Method:</u> During the process of RO, the fluoride salts are rejected along with other salts. Several hundred plants are working successfully across the country for removing fluoride content from water.

Iron Removal: The coastal belt of whole India and few places of hilly track are affected by iron in the ground water. Iron content also affects the life of human beings, particularly the blood hemoglobin. Common treatment for removal of iron is the oxidation and precipitation method. The BIRM (back-washable iron removal media) media filters are very effective in removing the iron. We employ MnO<sub>2</sub> as well as green sand to remove iron content in water.



Arsenic Removal: Arsenic poisoning or arsenicosis is caused by the ingestion, absorption or inhalation of dangerous levels of arsenic. Arsenic is a natural semi-metallic chemical that is found all over the world in groundwater. East India, particularly West Bengal, eastern states and northern hilly track are affected by arsenic content. Arsenic poisoning can cause major health complications if not treated, including death. Activated alumina process, coagulation method, and china clay adsorption method are commonly employed for removing Arsenic content from drinking water. However, RO systems give the best results in removing Arsenic.

## **STRATEGIC ALLIANCES**

AEPL, depending on the nature of project, used to have need based alliances with manufacturers and contractors. Few of our current alliances are as follows:

- Oriental Enterprises, Mizoram
- Solana Enterprises, Tamilnadu
- Hydrolysis, Tamilnadu
- Sri Sai Manasa Nature Tech Private Limited, Andhra Pradesh
- Conergy Energy Systems (India) Private Limited, Karnataka.

## **MANAGEMENT**

We, at AEPL, believe that the skills and passion of our people are critical in everything we do. Our multi-cultural team consists of Chemical Engineers, Mechanical Engineers, Electrical Engineers, Civil Engineers, Project Managers, Science Graduates and Economists. The key management comprises following members:

## M Rajkumar

Rajkumar is a Post-Graduate Engineer in Power Systems. He has served at various levels in Semi-Government, Private

and Public Sector organizations. He has about 20 years of professional experience and was involved in design and development of a wide array of power projects and water systems across India. He has involved in design, engineering and execution of several megawatt scale solar power projects and solar based water treatment plants viz. iron removal, arsenic removal, fluoride removal and mini rural water supply scheme for drought affected areas in the States of Bihar, Rajasthan and Tamilnadu. He was also involved in successful implementation of India's first SPV Market Development Programme under World Bank Line of Credit.

He has involved in design and execution of several medium and large scale water treatment projects funded by bi-lateral and

## Companies Worked

- Indian Renewable Energy Development Agency Limited (A Govt. of India Enterprise)
- Engineers India Limited (A Government of India Enterprise)
- EMMVEE Solar Systems Private Limited (A Joint Venture of EMMVEE, India & SolarCAP AS, Denmark)
- Tata Consulting Engineers Limited
- Punj Lloyd Delta Renewables Private Limited (A subsidiary of Punj Lloyd Limited)
- M/s Intergen Energy Limited (JV of Indogrec, UK & Pacific Export Import AZ, Dubai)

multi-lateral agencies such as World Bank, ADB & KfW. He has published several papers in the field of renewable energy and extensively travelled across Asia and Europe. He has managed and lead engineering and design works for projects (solar, biomass and water treatment system) valued more than Rs 200 billion, all within the service sectors that AEPL offers.

## V Ramachandran

V Ramachandran is a Chemical Engineer and has acquired his Master of Technology in Energy Conservation and Management. He is a Certified Energy Auditor by the Bureau of Energy Efficiency (BEE), and is specialized in process design of power plant, energy audits and water conservation studies. He has about fifteen (15) years of experience in

## **Companies Worked**

- Tata Consulting Engineers Limited (TCE)—Bangalore
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- ◆ The Energy and Resources Institute (TERI)–New Delhi
- APITCO Limited—Hyderabad
- Chemprojects Consulting Engineers Pvt. Ltd.–New Delhi

this field. He has conducted energy audits and water conservation studies for more than 50 industries like power plant, chemical industries, textile, cement, etc. He has published several articles and papers on energy conservation and waste heat recovery systems. He has visited Sweden, Maldives, Bangladesh and South Africa as part of his business.

# A Govindaraj

Govindaraj is an Electrical Engineer and acquired his Master degrees in both Energy Conservation & Management and Sustainable Power Generation. He is an Accredited Energy Auditor by BEE, and is specialized in energy audit of

electrical systems. He has about nine (9) years of industrial experience in this field and has conducted energy audits for more than 80 industries like power plant, chemical, pharmaceutical, cement, sugar, iron & steel, textile, commercial building, etc. He is specialized in

## Companies Worked

The Energy and Resources Institute (TERI)-Bangalore Sri Lakshmi Packagings-Hosur



performance evaluation of electrical systems, power quality assessment and harmonics analysis. He has published many papers on energy efficiency and management. He has visited Singapore, Japan, Uganda and Ghana as part of his assignments.

## Companies Worked

- Ion Exchange (India) Limited
- Ion Exchange Services Limited
- Trivikram Equipments & Services
   Aquaplus Technologies

## **V** Thangaraj

Thangaraj is a Chemical Engineer and has about 35 years of experience in both R&D and design engineering of water and wastewater treatment systems in leading Indian industries. He was instrumental in research and development of 'multi-directional filters'—an advanced version of PSF and up-flow filters, and 'iodine releasing resin'—for removal of bacterial contamination in potable water at Ion

Exchange (India) Limited. He has implemented several water and wastewater treatment systems for multifarious industries as well as other domestic water requirements.

#### **B Premkumar**

Premkumar is a graduate in Mathematics and has started his career with Ion Exchange Limited as sales and marketing executive of water and wastewater treatment systems. Now, he has about Sixteen years of rich experience in process

management and operation, sales, marketing, collection and team management. He has attended several technical conferences related to design and optimization of water and waste water treatment systems. Providing on-time services with superior quality and keeping customer relationship management on top-priority are the key strengths, which helps Mr Premkumar in attaining success in his professional career.

## Companies Worked

- Abhra Water Tech Private Limited (Pentair Group), Chennai
- Green World Enviro Tech, Chennai
- ABS Enviro Tech India Private Limited, Chennai
- Selvamani Exports & Imports India Private Limited, Chennai
- Fontus Water Limited, Chennai
- Ion Exchange Limited, Chennai

## PROJECTS EXECUTED BY AEPL TEAM

## **Solar Power Projects**

- Supply, installation, testing and commissioning of 15 kWp (4x3.75 kWp) off-grid solar system for BSNL-BTS sites under Tuticorin SSA for Conergy Energy Systems India Pvt. Ltd., Bangalore.
- Installation and commissioning of 100 kWp off-grid solar power project in District Hospital, Lawngtlai in Mizoram for EMMVEE Photovoltaic Power Pvt. Ltd., Bangalore.
- Annual Maintenance Contract of 1 kWp, 2 kWp & 5 kWp of Solar Photo Voltaic (SPV) Systems installed in various Forest Offices of Madhya Pradesh sub-contracted by M/s Conergy Energy Systems (India) Private Limited, Bangalore.
- Supply, installation, commissioning and comprehended maintenance contract of 14x10 kWp solar photovoltaic power plants and 6x2500 LPD solar water heaters at various Railway Stations in Assam for North Frontier Railway.
- Preparation of Detailed Project Report (DPR) for 1 MWp Solar Power Project at Udumalpet Municipality, Tamilnadu for Universys Energy Private Limited, Coimbatore.
- Annual Maintenance Contract of 850 solar street lighting systems and solar high mast lighting systems installed at various villages in Bihar State under BELTRON funding by Conergy Energy Systems (India) Pvt. Ltd., Bangalore.
- Design, basic engineering and cost estimation for 25 MW Solar PV Grid connected Plant in the state of Gujarat for Zeba Solar Pvt Limited.
- Design, basic engineering and cost estimation for 1 MW (10X100 kW) Solar PV Grid connected Plant for Police Academy, Mizoram.
- Design, basic engineering and cost estimation for 1 MW Solar PV Grid connected Plant for Pae Limited, Mumbai.
- Design, engineering and execution of 2 nos. of 3.2 kWp Solar PV cathodic protection system for IOCL pipeline in Bihar and Rajasthan
- Basic design and engineering, detailed project report, and cost estimation carried out for 50 MW CSP solar thermal power generation project
- Feasibility study, Detailed Project Report and Energy yield study prepared for 5 MWp grid connected SPV project for IOCL
- Feasibility study, detailed project report and energy yield study prepared for 5 MWp grid connected SPV project for Hiradhani Power Ltd
- EPC services for 5 MWp grid connected SPV project in the state of Rajasthan
- Design, engineering, planning, procurement and execution (part) of 5 MWp grid connected SPV plant at Bap,
   Rajasthan
- Design, engineering, procurement and planning of 372 kW (composite) solar PV system for Dabhol Bangalore pipeline project
- Design, engineering, planning, procurement and execution of 163 KWp (composite) solar PV projects comprising 50 kWp at Ludhiana, 45 kWp, 20 kWp & 12 kWp at Chandigarh, 25 kWp & 11 KWp at Amritsar



- Design, engineering, planning, procurement and execution (Part) of 45.68 kWp standalone PV system (explosive region) for offshore platform at Jakarta, Indonesia.
- Design, basic engineering and cost estimation for 5 MW grid connected SPV plant for APCA Power Pvt Ltd., Mumbai
- Design, basic engineering and cost estimation for 10 MW (2 X 5 MW) grid connected SPV plant for Welspun Energy Limited, New Delhi.
- Design, basic engineering and cost estimation for 10 MW (2 X 5 MW) grid connected SPV plant for Emami Cements Limited. Kolkatta.
- Design, basic engineering and cost estimation for 5 MW grid connected SPV plant for Oswal Mills Limited, Punjab.

## **Wind Energy Project**

 Design and basic engineering for Kochi-Kota pipeline and wind-hybrid system for ONGC (1 MW) offshore platform at Mumbai.

#### Water and Wastewater Treatment

- Design, engineering and supply of 500 I/h RO Plant for Brooks Enviro Tech, Chennai.
- Design, engineering, supply, installation and commissioning of 1000 I/h RO Plant at Pandian Heart Institute,
   Madurai
- Design, engineering, supply, installation and commissioning of 1000 I/h RO Plant at Sathyam Grand Resorts & Hotels. Chennai
- Design, engineering, supply, installation and commissioning of 1000 l/h RO Plant at Durai Sago Factory, Namakkal.
- Design, engineering, supply, installation and commissioning of 500 I/h DM Plant at Pandian Heart Institute, Madurai
- Design, fabrication, supply and supervision of MS softener of 7 t/h capacity for Veesons Energy Systems Pvt. Ltd.,
   Trichy
- Servicing of existing softener plant and supply of 1000 litre capacity water tank at HRS Building, Highways Research Station, Highways Department, Chennai.
- ◆ Design, engineering, supply, installation and commissioning of 2 KLD ETP at GoodRite Products, Chennai
- Design, engineering, supply, installation and commissioning of 40 KLD ETP at Pragathi Broiler Farms, Chennai
- Conducted feasibility study for zero discharge of dying effluent and commissioned a one MLD effluent treatment plant at Western India Cotton Mills, Popinacherry, Cannanore.
- Installed a 700 KLD textile effluent recycling system with conventional ETP and RO combination for Aurora Textile Processing Mills Private Limited at Tirupur.
- Conducted a study for colour removal of textile dying effluent using nano-filtration and silica reduction by chemical addition method at Reliance Textile Processing Private Limited, Tirupur.
- Erection and commissioning of a recycling plant for prickling acid water and heat treatment effluent using modern concept filters comprising Dyna sand filters, ultra filtration system, organic removal resin and RO plant at TVS Sundram Fasteners, Madurai.
- Erection and commissioning of recycling plant for car washing effluent and removal of oil and grease using ultra
  filtration at Bajaj Auto Limited, Chennai.
- Design, supply, erection and commissioning of water treatment plant and effluent treatment plant at Hindustan Motors Thiruvallore.
- Detailed engineering, erection, commission, operation and maintenance of effluent and sewage water treatment and recycling plants at Hyundai Motors Limited, Sriperumpudur.
- Design, fabrication, erection and commissioning of imported coolant oil effluent treatment plant at Rane Engine Valve Limited, Viralimalai.
- Design, supply, erection, supervision and commissioning of 860 KLD raw water treatment plant and textile effluent treatment plant with 90% recovery & zero discharge plant for Precot Meridian Limited, Hassan.
- Design, supply, erection, testing and commissioning of 280 KLD STP for Shree Rajarajeswari Medical College, Bangalore, Karnataka.

## **OFFICE LOCATIONS**

Registered Office	Bangalore	Chennai	Kovilpatti	Dharmapuri
23-B Vignesh Illam	2nd Floor, No.2947	12A, Gandhi Street	No. 31/13 East Car Street	#2/3, 11 Vallal Adhiyaman
Lakshmi Puram	6th Cross, 18th A Main	Opp. Perumal Kovil	Near Shenbagavalli Amman Kovil	Complex
Ganapathy, Coimbatore	HAL 2nd Stage	Keezhkattalai	Kovilpatti – 628 501	Adhiyaman Kottai
Tamilnadu – 641 006	Bangalore -560008	Chennai – 600 117	Tuticorin District	Dharmapuri – 636 807
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