



The LucidPipe Power System captures energy stored in moving water to turn its turbine which turns a generator to produce electricity. This electricity is then conditioned with rectifiers and inverters to produce grid ready AC power.

The total power produced is linked to flow of water and the excess head pressure, or the vertical distance through which the water has fallen. The quantity of the water flowing per second, or the flow rate, and the excess head pressure is computed in order to determine the amount of available energy that can be captured.

Base load power is an energy plant devoted to meeting continuous energy demand, and produce energy at a constant rate, usually at a low cost relative to other production facilities available to the system. Examples of baseload plants using nonrenewable fuels include nuclear and coal-fired plants. Among the renewable energy sources, hydroelectric, geothermal, biogas, biomass, solar thermal with storage and ocean thermal energy conversion can provide baseload

power. Baseload plants typically run at all times through the year except in the case of repairs or scheduled maintenance.

LucidPipe also has the desirable attribute of dispatchability. **Dispatchability** or **dispatchable generation** refers to sources of electricity that can be dispatched at the request of power grid operators; that is, generating plants that can be turned on or off, or can adjust their power output on demand. This is in contrast with certain types of base load generation capacity, such as nuclear power, which may have limited capability to maneuver or adjust their power output, or intermittent power sources such as wind and solar energy which cannot be controlled by operators.

Conduit is a pipe or channel for carrying a fluid.

Effluent is an out flowing of water from a natural body of water, or from a human-made structure such as a waste water treatment plant or industrial facility.

Electric generator is a device that converts mechanical energy to electrical energy.

Energy-Water Nexus is the growing awareness that it takes a lot of energy to capture, purify and distribute water. It also takes a lot of water to produce energy. It is estimated that 6% of energy in the US is consumed for water. Energy is often the highest cost in a municipality. The EPA estimates that the US requires \$650 billion of investment in its water infrastructure. Much of this is to ensure energy and water security.

Flow rate- Volume of water passing a point in a given amount of time. As the water flow rate increases, the turbine spins faster and more electricity is generated.

Head - The vertical height of the free surface of a body of water above a given point downstream to where the turbine is located. Head is typically used to define water pressure and is usually measured in feet or PSI.A

Inverter - a device that converts direct current to alternating current for interconnection to the grid.

Lift based turbines use lift forces generated from a set of air-foil shaped blades. Seen often in wind turbine designs where they efficiently produce energy in constant flows.

Net Metering – Energy generating facilities can offset their electrical bill when their generators are producing more energy than their demand.

Outfall is the discharge point of a waste stream into a body of water; alternatively it may be the outlet of a river, drain or a sewer where it discharges into the sea, or a lake.

Pressure Reducing Valve (PRV) - PRVs are commonly used in water systems to reduce the pressure of water flowing between zones of the water system, and to reduce pressure to a level appropriate for use by water system customers. Tens of thousands of PRV valve applications are estimated to be operating in the United States. PRVs are an excellent indicator of significant pressure in a system that can benefit from the LucidPipe Power System. We want to deploy our systems in

a PRV zone, but upstream of the PRV so to convert the excess pressure to energy before it gets dissipated by the PRV. This will also reduce wear and tear on expensive PRVs in the water system.

A **rectifier** is an electrical device that converts alternating current (AC) to direct current (DC), which flows in only one direction.

A **Renewable Portfolio Standard (RPS)** is a regulation that requires increased production of energy from renewable energy sources, such as wind, solar, biomass, and geothermal. Other common names for the same concept include Renewable Electricity Standard (RES) at the United States federal level.

A **vault** is an underground room providing access to equipment, such as valves for water systems. Vaults are commonly constructed out of reinforced concrete boxes or poured cement. Small ones are usually entered through a manhole.

Velocity – The rate of flow of water, expressed in feet per second (FPS).