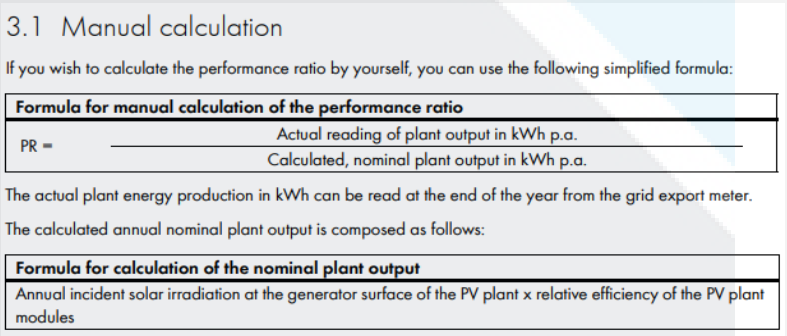
Energy KPIs

KPI	Formula	Definition
Power Cuts and Average Duration	Power Cuts: Add the amount of times power was cut off unintentionally Average Duration: (Total time power was cut off/Total amount of times power was cut off)	Is a period of time when the electricity supply to a particular building or area is stopped, sometimes deliberately. However, when power cuts come as a surprise it is important to have measures in place capable to quickly respond to it and restore the well-functioning state.
Consumption by Sector	Separate the different sectors into groups and track the amount of energy each sector uses in a given time.	As an energy provider, tracking the evolution of consumption by sector helps you understand who your main consumers are and therefore provide an adequate answer to their needs. The energy required by big industrial plants is not delivered in the same way as for suburban households, who do not consume the same amount either. Breaking down the consumption by sector is a best practice to know which area uses the most energy, and through which you may adapt your production and delivery accordingly.
Availability Factor	(Total time energy source is operating/Total time)*100	The percentage of time a plant is able to operate. For a nuclear powerplant with 90% availability, it means that only 10% of its time is off for maintenance or downtime. Comparing various plants availability can allow to identify weaknesses or problematic equipment – but the plants have to be similar in production (solar compared to solar, wind to wind, etc.)
Return on Investment (ROI)	((Final Value of investment-Initial Value of Investment)/Cost of Investment)*100	An approximate measure of an investment's profitability. In pre-development projects, the ROI is a critical measure that can be used to help decide if a project proceeds or not.
Average Cost	((Fixed Costs + Variable Costs)/Total output)	Production cost per unit of output, computed by dividing the total of fixed costs and variable costs by the number of total units produced (total output). Lower average costs are a potent competitive advantage. Also called unit cost. This could be used in the energy industry to find out what the average cost per unit of energy that is sold/used by customer.
Cost of Electricity (COE)	**Equation 1** $COE = \underbrace{\frac{\beta \cdot C}{P \cdot H}}_{\text{Capital}} + \underbrace{\frac{f}{\eta}}_{\text{Fuel}} + \underbrace{\left\{\frac{OM_f}{P \cdot H} + \mu \cdot OM_{v,b}\right\}}_{\text{O\&M}}$ where β = Levelized carrying charge factor or cost of money C = Total plant cost ($) H = Annual operating hours P = Net rated output (kW) f = Levelized fuel cost ($/kWh [LHV]) η = Net rated efficiency of the combined-cycle plant (LHV) OM_f = Fixed O&M costs ($ or $/kW-yr) $OM_{v,b}$ = Variable O&M costs for baseload operation ($/kWh) μ = Maintenance cost escalation factor (1.0 for baseload operation) **Equation 2** $COE = \underbrace{\left\{\frac{\beta \cdot C + OM_f}{P_{eff} \cdot H_{eff}} + \frac{f}{\eta_{eff}} + \mu \cdot OM_{v,b}\right\}}_{\text{Modified COE}} + \underbrace{\sum_i c_i \cdot m_{p,i}}_{\text{Emissions}} + \underbrace{\frac{S_e \cdot \Delta P + S_e \cdot \Delta}{P_{eff} \cdot H_{eff}}}_{\text{System impa}}$	COE is a widely used metric for comparing power plant system alternatives. Traditionally, it combines a power generation system's ownership costs (capital and operating) and thermal performance (output and efficiency). This metric is useful when comparing power generation alternatives that use similar technologies.

Energy Production Distribution	(amount of any certain energy provided to customers/Total amount of all energy provided to customers)*100	The production distribution is the process through which power – electricity or gas – is delivered to end users (domestic and industrial consumers). Whether you are a company producing and transporting energy, or solely a distribution network operator (DNO), you want to know in which quantity the various types of energy are distributed to consumers. It is one of the energy metrics that is highly linked to consumer behavior analyzing the distribution amount for the different energy types, and thus the consumers' demand, you may adapt your offer and supply accordingly.
Performance ratio (PR)	 A measure of the quality of a PV plant that is independent of location and it therefore often described as a quality factor. The performance ratio (PR) is stated as percent and describes the relationship between the actual and theoretical energy outputs of the PV plant. It thus shows the proportion of the energy that is actually available for export to the grid after deduction of energy loss (e.g. due to thermal losses and conduction losses) and of energy consumption for operation	
Electrical Energy Usage	Energy= Power*Time The amount of energy used in a certain amount of time E.g. If a 40 watt lamp is turned on for one hour, how many joules of electrical energy have been converted by the lamp? Energy (w) = Power x Time Energy = 40 x 3600 = 14,400 joules Note: if an appliance has a rating of one watt it means it converts one joule of electrical energy to some other form every second. Because the joule is such a small unit, quantities of energy are often given in kilojoules. I.e, thousands of joules. Therefore the above answer could be written as 14.4 kJ.	
Labor Efficiency	((Standard Labor Hours/Amount of time worked)*100) Where Standard Labor Hours is the standard amount of time is should take for an employee to complete a project	While productivity measures quantity, efficiency measures quality. You could calculate a very high productivity number per employee, but that number alone doesn't give you any insight into the quality of work (in theory, an employee could seem very productive, but actually be producing horrible outputs).

For a review of your KPIs, contact us for a free consultation!