

Comments for Authors:

1- In my opinion, in the revised manuscript, the materials and methods presented (such as Figure 1 and Figure 2 and related statements) are still based on the obsolete version of the standard (ISO 50001:2011). Therefore, the following Figures and statements are suggested for applying in the article, if desired.

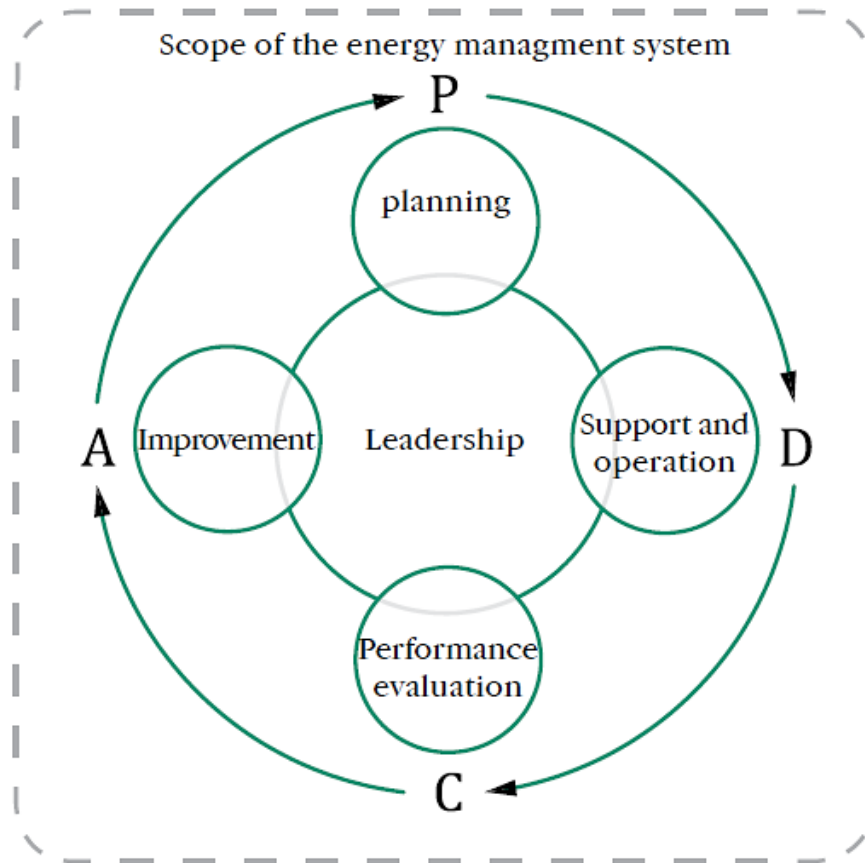


Figure 1. The PDCA cycle model (Plan, Do, Check, Act) [ISO 50001:2018].

According to ISO 50001:2018, in the context of energy management, the PDCA approach can be outlined as follows.

— Plan: understand the context of the organization, establish an energy policy and an energy management team, consider actions to address risks and opportunities, conduct an energy review, identify significant energy uses (SEUs) and establish energy performance indicators (EnPIs), energy baseline(s) (EnBs), objectives and energy targets, and action plans necessary to deliver results that will improve energy performance in accordance with the organization's energy policy.

— Do: implement the action plans, operational and maintenance controls, and communication, ensure competence and consider energy performance in design and procurement.

— Check: monitor, measure, analyse, evaluate, audit and conduct management review(s) of energy performance and the EnMS.

— Act: take actions to address nonconformities and continually improve energy performance and the EnMS.

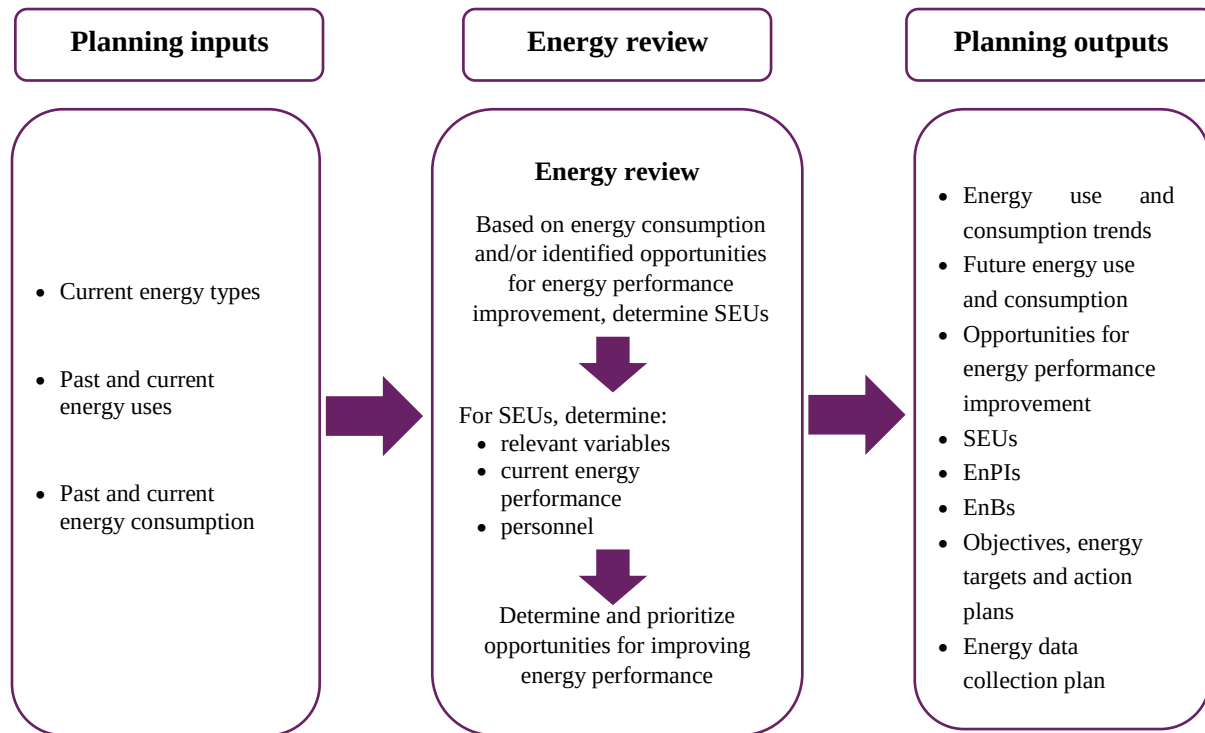


Figure 2 — Methodology used, based on the standard ISO 50001:2018 [ISO 50001:2018]

2- The methods applied in the research for developing EnPIs and EnBs and related results are also based on the ISO 50001:2011. In accordance with ISO 50001:2018 the multivariable linear regression method can be used for developing EnPIs and EnBs in the case studies (hotels). Please take a look at the following table:

Types and applications of EnPIs

EnPI type	Useful for	Examples	Observation
Measured energy value	- Measuring reductions in absolute use or consumption of energy - Meeting regulatory requirements based on absolute savings - Monitoring and control of energy stocks and costs - Understanding trends in energy consumption - Obtained when measurement of energy consumption is given by a meter, with or without a conversion factor	- Energy consumption (kWh) for lighting - Fuel consumption (GJ) of boilers - Electricity consumption (kWh) during peak hours - Peak demand (kW) in month - Total energy savings (GJ) from energy efficiency related programmes	- Does not take into account the effects of relevant variables, giving misleading results for most applications - Does not measure energy efficiency
Ratio of measured values	- Monitoring energy efficiency of systems that have only one relevant variable - Monitoring systems where there is little or no base load - Standardizing comparisons across multiple facilities or organizations (benchmarking) - Meeting regulatory requirements based on energy efficiency - Understanding energy efficiency trends - Can express the energy efficiency of a piece of equipment or a system	- kWh/tonne of production - GJ/unit of product - kWh/m² of floor space - GJ/man-day - litres of fuel per passenger kilometre - Conversion efficiency of a boiler (%) - Input energy/output energy (for instance, "heat rate" in power generation facilities) - kWh/MJ for cooling systems - kW/Nm³ for compressed air systems - L/100km - kWh/value-added in unit of currency - kWh/unit of sales	- Does not account for base load and nonlinear energy use effects; will be misleading for facilities with a large base load
Statistical model	- System with several relevant variables - System with base load energy consumption - Where comparison requires normalization - Modelling complex systems where the relationship between energy performance and the relevant variables can be quantified; - Organizational level energy performance with several relevant variables - Illustrates the relationship between energy consumption and relevant variables	- Energy performance of a production facility with two or more product types - Energy performance of a facility having a base load - Energy performance of a hotel with variable occupancy rate and outside temperature - Relationship between the energy consumption of a pump/fan and the flow rate	- For models with multiple variables relationships can be difficult to determine and models can take time to create and can be difficult to ensure accuracy - May not be clear if any residual error is due to modelling error or lack of control over energy consumption - May be inaccurate if not confirmed by statistical tests - Requires a detailed system understanding to define the correct functional form of relationship expected when data are not linear - Models should be maintained to ensure valid results
Engineering model	- Evaluating energy performance from operational changes where variables are numerous. - Transient processes and/or systems involving dynamic feedback loops - For systems with interdependent relevant variables (such as temperature and pressure) - Estimating energy performance at a design stage	- Industrial or power generation systems where engineering calculations or simulations enable accounting for changes in relevant variables and their interactions - Model of the electricity consumption of a chiller using the demand for cooling, the outside temperature (condensing temperature) and inside temperature (evaporating temperature) - Whole building models that account for hours of operation, centralized versus distributed HVAC systems, and varying tenant needs	- Models should be maintained to ensure valid results

According to the above Table, the appropriate EnPI for hotels is a statistical model since there are two relevant variables i.e. DG and RDO; however, the authors used ratio $(\frac{Electricity\ Consumption\ (kWh)}{RDO \times DG})$. Hence, in my opinion, $\frac{kWh}{RDO \times DG}$ is included in the category of traditional indicators in the field of EnMS.

Therefore, I suggest the authors use the multivariable linear regression method ($Y = \text{Electricity Consumption (kWh)}, X_1 = \text{DG and } X_2 = \text{RDO}$) to develop EnB and EnPI and report the R-squared value as well as P-values. In this case, the EnB is obtained as $Y = a X_1 + b X_2 + c$.

Moreover, according to Table 1 (Page 15), the EnPI using ratio $(\frac{kWh}{RDO \times DG})$ was proposed by other researchers (reference # 35) in 2018 with $R^2 = 0.92$. The 5% improvement in the R^2 value appears to be due to the data quality and/or data analysis techniques such as data filtering or outlier elimination.

Table 1. Analysis of energy performance indicators most used in the hotel industry.

Energy performance indicator used	Correlation obtained (R^2)	References
$\frac{kWh}{People}$	-	[54]
$\frac{kWh}{RDO}$	0.51	[32]
$\frac{kWh}{month \times RDO}$	0.65	[55]
$\frac{kWh}{month}$	0.67	[9,56]
$\frac{m^2}{kWh}$	0.72	[25,38,57]
$\frac{Hours \times Degrees}{kWh}$	0.73	[58]
$\frac{Degree \times Days}{kWh}$	0.77	[39]
$\frac{Equivalent \times Occupation}{kWh}$	0.80	[7]
$\frac{RDO \times Equivalent}{kWh}$	0.90	[32]
$\frac{Day \times Rooms \times Degree \times Day}{kWh}$	0.91	[59]
 $\frac{RDO \times DG}{kWh}$	0.92	[35]
$\frac{DG \times RDO}{kWh}$	0.97	Result of this investigation

Finally, I recommend the above method (multivariable linear regression method) to improve the quality of the manuscript, and the authors can apply it if they wish.