PEI vs ER FAQ

Pump Energy Index (PEI) and Energy Rating (ER) are both metrics that describe comprehensive, system-level, comparable energy performance of pumps, including bare pumps, pumps equipped with motors, and pumps equipped with motors and drives.

PEI is a metric defined by the Department of Energy (DOE) and is required to be listed on all clean water pumps within the scope of the DOE regulations as of January 27, 2020. It is determined separately for constant load pumps (PEICL) and variable load pumps (PEIVL) and describes the ratio of the weighted average input power of the tested pump over the weighted average input power of a pump and motor that are minimally compliant with DOE's regulations. See 10 CFR 431.464 or http://pumps.org/DOE_Rulemaking.aspx for more information.

ER is a voluntary program run by the Hydraulic Institute that builds on the DOE's regulatory framework and PEI metric to provide an expanded, market facing, third-party certified label of equipment performance that is easily understood and used in the market place. Specifically, ER is a direct translation of PEI and is calculated as $ER = (1 - PEI) \times 100$; it describe the percent reduction in energy consumption of the tested pump compared to DOE's baseline minimally compliant pump. Being a nominal value, where higher is better, it is **easier for the market to understand and use than PEI** (which is a value between 0 and 1.00 and lower is better). ER can also be used to easily calculate energy and cost savings using the following equations:

$$Energy\ Savings\ (\frac{kWh}{year}) = \frac{ER}{100} \times (\frac{kW}{hp} conversion) \times OpHrs$$

$$Cost\ savings\ \left(\frac{\$}{year}\right) = Energy\ Savings\ \left(\frac{kWh}{year}\right) \times Rate(\frac{\$}{kWh})$$

The ER label and program also **requires testing in third-party certified laboratories**, which lends increased rigor and confidence to the data that is available in a public-facing database.

Finally, with the HI Energy Rating, **it is possible to capture additional savings** when a more efficient motor and/or controls are added to a pump after it has left the manufacturer's facility, which is missed in the DOE manufacturer requirements. The additional savings of the as installed pump system can be claimed with the Energy Rating Certificate, which reflects an updated Energy Rating due to the addition of a more efficient motor and/or controls to a pump listed in the Energy Rating Database. The unique Certificate for an Extended Pump Product is done through a standard calculator, and is logged into the Energy Rating Database where it can potentially be used in areas where electric utilities provide deemed incentives. This is of particular importance for situations where code requires a variable load pump, and the distribution channel adds the variable speed drive. ER Certificates can be generated on er.pumps.org.

This increased flexibility may also be valuable in the future as HI could opt to include additional pumps not covered by PEI or the DOE scope, which may unlock additional opportunities for energy savings and incentives.

For more information see: http://pumps.org/EnergyEfficiency/Energy_Rating.aspx

For these reasons, reference ER, or ER and PEI, as the metrics used to identify efficient products in utility programs is advantageous to align with existing market momentum around HI's Energy Rating, leverage the rigor of third-party certified test data, and allow for maximum energy savings through the addition of new products not fully captured by DOE's PEI metric.