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**Battelle Number(s):**

15161

Patent(s) Issued

Available for licensing in all fields

Available Technologies

# Power Quality-Improving Appliances

## SUMMARY

The proliferation of electronic loads has been accompanied by increasingly poor power quality, which leads to decreased efficiency overall in energy consumption -- more power, in effect, must be generated to do a job.

Ubiquitous, inexpensive rectifiers significantly misshape premises electrical current waveforms. These devices and uncorrected induction motor loads also reduce power factor. While most premises loads tolerate these inexpensive power supplies and the poor power quality of their nearby appliances, the effect becomes additive within premises and on distribution feeders. Poor current waveforms can cause poor voltage waveforms as they interact with distribution line impedances. Remaining power factor problems must be eventually corrected at substations and exacerbate existing distribution capacity constraints. Harmonic power quality problems can overheat distribution transformers and contribute to system inefficiencies.

Researchers at PNNL have developed a power quality-improving (PQI) appliance, which is a small electrical load that observes the current and voltage waveforms at the electrical entrance of its premises and modifies its own electrical energy consumption to improve the overall current waveform of the entire premises. By doing so, it can improve or correct both the aggregate harmonic power quality and power factor of the premises, thus making the premises appear to be an ideal electrical customer from the utility side of the premises meter.

## ADVANTAGES

- \* Improves system power factor
  
- \* Improves system harmonic power quality

## STATE OF DEVELOPMENT & AVAILABILITY

A laboratory prototype for this technology has been developed. This technology is available for licensing in all fields of use.



### Patents & Intellectual Property

- » Patent Publication #: 2009/0033296

### Technology Portfolio(s)

- » Electricity Infrastructure
- » Smart Grid Devices

### Potential Industry Applications

- » Consumer Products
- » Energy & Utilities
- » Manufacturing & Warehousing

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**Peter C. Christensen**  
Pacific Northwest National Laboratory  
(509) 371-6159  
peter.christensen@pnnl.gov  
<http://availabletechnologies.pnnl.gov>



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