



## Making a brighter future possible

As a result of the increasing number of states that are adopting aggressive renewable and alternative energy portfolios, the solar energy market is growing—nearly doubling year over year. Eaton, a key innovator and supplier in this expanding market, is proud to offer Cooper Power™ series Envirotran™ transformers specifically designed for solar photovoltaic medium-voltage applications. Eaton is working with top solar photovoltaic developers, integrators and inverter manufacturers to evolve the industry and change the way we distribute power.

In accordance with this progressive stance, every Cooper Power series Envirotran solar transformer is filled with non-toxic, biodegradable Envirotemp™ FR3™ dielectric fluid made from renewable seed oils. On top of its biodegradability, Envirotemp FR3 fluid substantially extends the life of the transformer insulation, saving valuable resources. What better way to distribute green power than to use a green transformer? In fact, delaying conversion to Envirotran transformers places the burden of today's environmental issues onto tomorrow's generations.

Eaton can help you create a customized transformer based on site-specific characteristics including temperature profile, site altitude, solar profile and required system life.

Some of the benefits gained from this custom rating include:

- Reduction in core losses
- Improved payback on investment
- Reduction in footprint
- Improved fire safety
- Reduced environmental impact

Finally, when it comes time for decommissioning of your Envirotran solar transformer, virtually all materials, from the durable core and cabinet steel to the biodegradable Envirotemp FR3 fluid, can be easily and economically recycled or reclaimed.



Envirotran solar transformers, when evaluated on total ownership cost (TOC), can save you money on losses and maintenance. For example, the table below shows the savings you could experience by allowing Eaton to site-optimize the transformer design.

Rating	No load	Load	No load loss ❶	Load loss	Price	Total ownership cost
1000 kVA	1600 W	8280 W	\$15,720	\$3530 ❷	\$32,000	\$51,250
Optimized	1250 W	6690 W	\$12,280	\$5070 ❸	\$27,000	\$44,350
						<b>14% savings</b>

❶ Based on 20 years, 5% interest, 9c/kWh.

❷ 21% average loading.

❸ 28% average loading.

**Note:** Values above for illustrative purposes only. Actual values will depend on many factors not discussed here.



Powering Business Worldwide

# Why Envirotran solar transformer?

## Environmentally desirable

Envirotran solar transformers are friendlier to the environment. While traditional liquid-filled transformers use mineral oil or synthetic oils, Envirotran transformers use the revolutionary, vegetable oil-based, dielectric coolant—Envirotemp FR3 fluid. Envirotemp FR3 fluid is made from soybeans, making it both non-toxic and non-hazardous. Moreover, because Envirotemp FR3 dielectric fluid is petroleum independent, it doubles as a valuable renewable resource with a carbon-neutral footprint.

## Quality matters

Choosing Eaton's Cooper Power series reliable and durable Envirotran solar transformer allows you substantial cost savings, delayed capital expenditures and maximized power handling performance. It all starts with the superior performance of Envirotemp FR3 fluid, preserving and protecting the paper insulation found in each coil. This extended insulation life coupled with the non-hazardous properties of Envirotemp FR3 fluid makes the Envirotran solar transformer design an industry leader in quality and reliability.

## High fire point

Envirotemp FR3 fluid, which has a fire point above 300 °C, highly reduces the likelihood of a fire within the transformer. In more than 30 years of field experience, no Cooper Power series less-flammable fluid-filled transformer has resulted in a pool fire. Mineral oil, while exhibiting reliable dielectric properties, typically does not provide an adequate margin of fire safety during transformer failure. With a fire point at nearly double (300 °C compared to 155 °C) of mineral oil, switching to Eaton's Cooper Power series Envirotran solar transformer filled with Envirotemp FR3 fluid will greatly minimize the long-term risk associated with catastrophic transformer failures.



## Product scope

Description	Specification
Type	Three-phase, 50 or 60 Hz, 65 °C rise (55 °C, 55 °C/65 °C), 75 °C, 65/75 °C
Fluid type	Envirotemp FR3 fluid
Size	45–12,000 kVA
Primary voltage	2400–46,000 V
Secondary voltage	208Y/120 V to 14,400 V
Coil configuration	2-winding or 4-winding or 3-winding (low-high-low), 3-winding (low-low-high)
Specialty designs	Inverter/rectifier bridge K-Factor (up to K-19) Vacuum fault interrupter (VFI) UL listed, labeled and classified Factory mutual (FM) approved Solar/wind designs Differential protection Seismic applications (including OSHPD)



For Eaton's Cooper Power series product information, visit  
[Eaton.com/cooperpowerseries](http://Eaton.com/cooperpowerseries)

**Eaton**  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
[Eaton.com](http://Eaton.com)

**Eaton's Power Systems Division**  
2300 Badger Drive  
Waukesha, WI 53188  
United States  
[Eaton.com/cooperpowerseries](http://Eaton.com/cooperpowerseries)

© 2017 Eaton  
All Rights Reserved  
Printed in USA  
Publication No. PA202009EN / Z19894  
Supersedes B210-10040  
September 2017

**EATON**  
Powering Business Worldwide

Eaton is a registered trademark.

All other trademarks are property of their respective owners.

Follow us on social media to get the latest product and support information.

