

Slides presented at informational webinar held on August 9, 2013.

The webinar was recorded and is posted on the website.

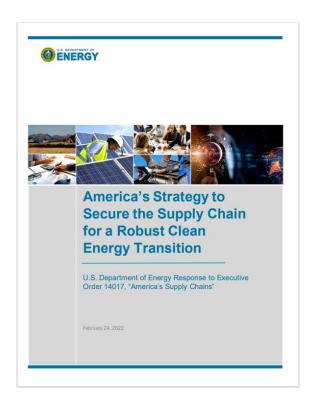


## **Manufacturing & Energy Supply Chains Office**

**Dave Howell – Principal Deputy Director** August 9, 2023



# Executive Order 140 17: America's Supply Chains (February 2021–2022)



- The first-ever comprehensive U.S. government strategy to secure our domestic energy supply chains and an Energy Industrial Base
- Lays out dozens of critical strategies and actions to build secure, resilient, and diverse domestic energy supply chains

#### Deep-Dive Assessment Report Topics

- High-Capacity Batteries 100-Day Report
- Carbon capture materials
- Electric grid including transformers and high voltage direct current
- Energy storage
- Fuel cells and electrolyzers
- Hydropower including pumped storage hydropower
- Neodymium magnets
- Nuclear energy
- Platinum group metals and other catalyst
- Semiconductors
- Solar photovoltaics
- Wind
- Commercialization and competitiveness
- Cybers ecurity and digital components

https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain



#### **MESC Mission and Distinctives**

Support Scale-Up and Deployment of manufacturing infrastructure critical to the Nation's energy supply to assure a resilient and sustainable energy sector industrial base (ESIB).

- New manufacturing infrastructure to fill critical ESIB gaps
- Manufacturing Facility Upgrades to Reduce Energy Burden and Industrial Base Carbon Emissions
- Develop domestic manufacturing and energy workforce capabilities and resources

# Support integrated insights across manufacturing and energy supply chains





### **Program Offices**

## **Facility and Workforce Assistance Office**

Supporting small and medium manufacturing growth, industrial decarbonization, and workforce for energy and manufacturing industries

#### **Primary Stakeholders**

- A Broad Group of Industrial Enterprises and Regional Manufacturers
- Academia: Universities, Community Colleges, Technical Schools
- State/Local Governments

## Battery and Critical Materials Office

Developing a domestic Batteries and Critical Minerals manufacturing supply chain from cradle to grave and recycling.

#### **Primary Stakeholders**

- Upstream and Mid-Stream Mineral Processing, Refining, and Materials Production Enterprises
- Recycling Enterprises
- Focus on
  - Battery materials
  - Rare Earths
  - Platinum Group Metals
  - Other Critical Materials

## **Analysis and Strategic**Investment Office

Analysis and support to build capabilities across energy technologies and throughout the supply chain for critical components, devices, and systems.

#### **Primary Stakeholders**

- Mid-Stream and Down-Stream Components, Device, and Systems Manufacturing Enterprises
- Supply Chain Planning and Forecasting Stakeholders
- Focus Areas: Grid components, Energy Storage, Solar/Wind, Fuel Cells/ Electrolysis, plus others



#### MESC Program Office Initiatives

# Facility and Workforce Assistance

\$1.365 Billion

- FY23 Industrial Assessment Centers (IACs)
  - BIL 40523 IAC Expansions
  - BIL 40521 IAC Implementation grants
- ➤ BIL 40209 Manufacturer and Recycling Grants in Distressed Communities
- ➤ BIL 40534 State Manufacturing Leadership

## Battery and Critical Materials

\$6.215 Billion

- ➤ BIL 40207(b) Battery Material Processing Grants
- ➤ BIL 40207(c) Battery Manufacturing and Recycling Grants
- ➤ BIL 40207(f3) Battery Recycling: State/Local Programs
- ➤ BIL 40207(f4) Battery & Crit. Mineral Recycling: Retailer Collection
- ➤ BIL 40205 Rare Earth Demonstration (with FECM)

## Analysis and Strategic Investment

\$2.275 Billion

- ➤ BIL 40555 Rebate Program
- > IRA IRS 48C Tax Credits
- ➤ IRA 50143 Manufacturing Conversion Grants
- ➤ IRA Defense Production Act (DPA)
- > FY23 Technical Assistance Modeling, Mapping, and Analysis



### Stay connected: MESC activities and opportunities

#### Join the MESC Newsletter

Stay in Touch! Sign up to receive MESC Updates via the QR code below and/or contact our team by emailing <a href="MESC@hq.doe.gov">MESC@hq.doe.gov</a>.



# Defense Production Act (DPA) Authority

**DPA Title III – Expediting production and deliveries or services**: "To reduce current or projected shortfalls of industrial resources, critical technology items, or essential materials needed for national defense purposes"

In June 2022, Pres. Biden invoked DPA §303 to provide **DOE** with **DPA Authority to invest in American manufacturing in five technology families**:

- Transformers and electric grid components
- Clean hydrogen
- Solar components
- Insulation
- Heat pumps

A March 2023 summary of responses received to a DOE DPA Request for Information (RFI) across technology areas is available at: <a href="https://www.energy.gov/mesc/enhanced-use-defense-production-act-1950">https://www.energy.gov/mesc/enhanced-use-defense-production-act-1950</a>

While appropriations to date were directed specifically to heat pumps, DOE/MESC is prepared to continue supporting transformers and electric grid components as funds are available.







www.energy.gov/mesc



Thank you.





# MESC

OFFICE OF MANUFACTURING AND ENERGY SUPPLY CHAINS

# Transformer and EPS Rebate Programs

DEPARTMENT OF ENERGY OFFICE OF MANUFACTURING AND ENERGY SUPPLY CHAINS

OFFICE OF MANUFACTURING AND ENERGY SU



## | Program Overview

#### Extended Product System (EPS) Rebate Program

- Section 40555(1) Infrastructure Investment and Jobs Act (BIL)<sup>†</sup>
- EPSs are combinations of electric motors, electronic control, and driven load (e.g., pumps, fans, and compressors).
- \$10 million in rebates for purchases of EPS or incorporation of EPS in equipment placed back into service in 2021 and 2022.

#### Transformer Rebate Program

- BIL section 40555(2)<sup>‡</sup>
- \$10 million in rebates for purchases of efficient distribution transformers that replace inefficient distribution transformers.



## | TRANSFORMERS



## | Transformer Qualified Entities and Eligibility Window

A Qualified Entity means an owner of industrial or manufacturing facilities, commercial buildings, or multifamily residential buildings; a utility; or an energy service company that fulfill the requirements of the rebate program.

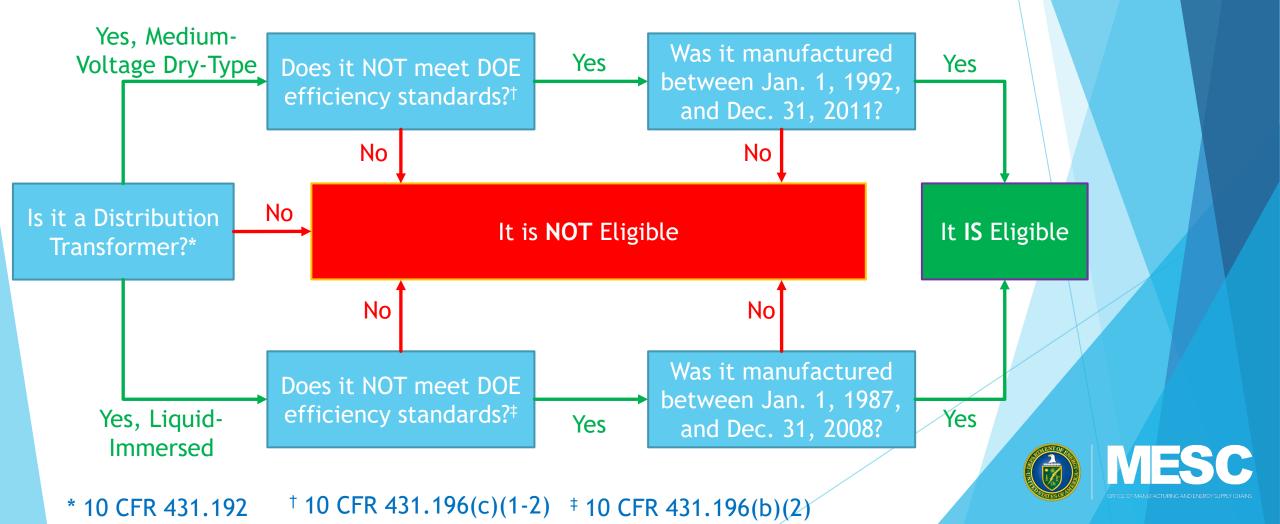
Any qualified entity that is the purchaser of a qualified energy efficient transformer who has replaced a qualified inefficient transformer may apply for a rebate for current, future, or past replacements.

Rebates will be distributed based on when applications are received with additional preference given to applicants that are replacing a qualified energy inefficient transformer in a disadvantaged community, until the exhaustion of funds.



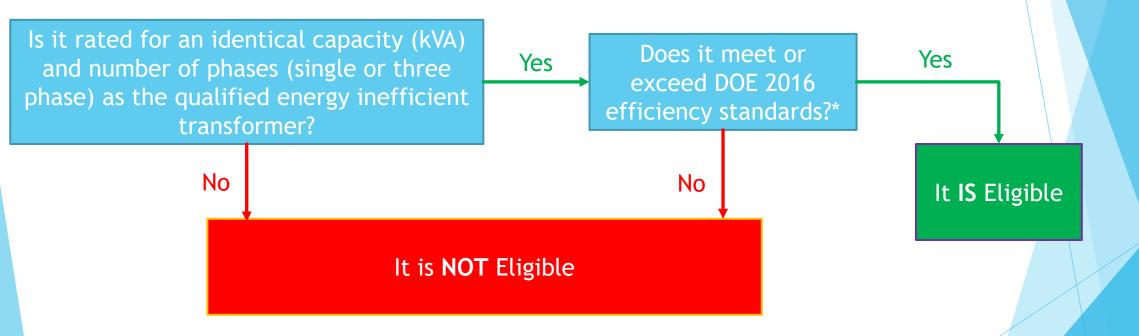
## | Qualified Energy <u>Inefficient</u> Transformers

See statute and implementation guidance for full details



# | Qualified Energy *Efficient* Transformers

See statute and implementation guidance for full details





# | Transformer Rebate Calculation

The rebate per transformer  $(R_T)$  is \$2 multiplied by the difference in core loss (in Watts) between the replaced energy inefficient transformer  $(L_i)$  and the installed energy efficient transformer  $(L_e)$ .

$$R_T(\$) = 2 \cdot (L_i - L_e)$$

For example, if the replaced transformer has a core loss of 2,026 W and the new transformer has a core loss of 680 W, the total rebate would be \$2,692.

$$R_T(\$) = 2 \cdot (2,026 - 680) = \$2,692$$

Entities may initially receive up to a \$25,000 cap in aggregate transformer rebates, which may be raised at DOE's discretion.

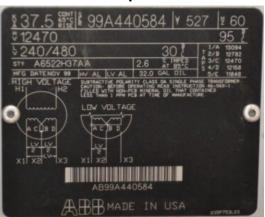


## | Transformer Submission Requirements

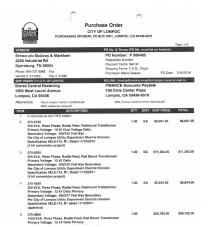
See statute and implementation guidance for full details

- 1. Description of the applicant.
- 2. Evidence the decommissioned transformer is qualified and has been decommissioned and scrapped.
- 3. Evidence the replacement transformer is qualified.
- 4. Executive officer signature certifying application accuracy.

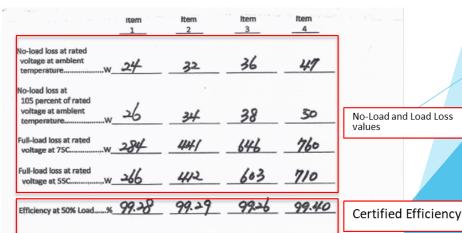
Nameplate



Proof of Purchase



**Efficiency Certification** 



## | EXTENDED PRODUCTS SYSTEMS



# | EPS Qualified Entities and Eligibility Window

#### A Qualified Entity is either:

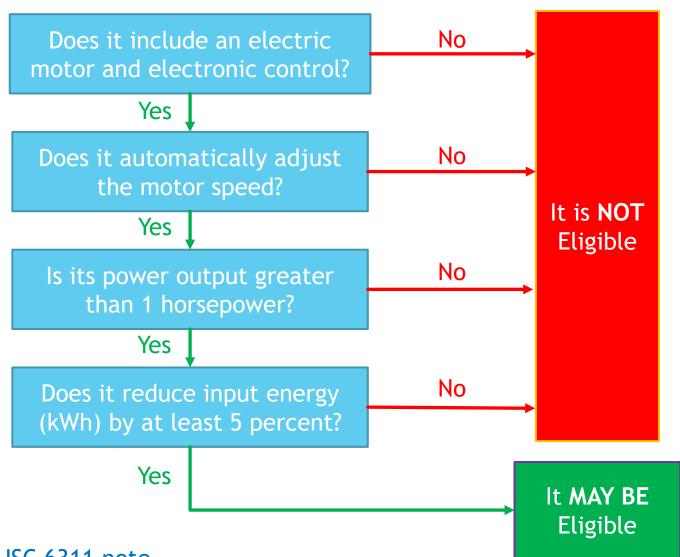
- The purchaser of a qualified, installed EPS; or
- The owner of redesigned machinery or equipment that did not previously use an EPS who incorporates an EPS into that machinery or equipment

Rebates will be distributed based on when applications are received, until the exhaustion of funds.



## | General EPS Qualifications

See statute and implementation guidance for full details





## **Product Requirements**

#### See statute and implementation guidance for full details

Table 2: Air Compressor Qualifying Criteria

Equipment class	Qualifying Criteria Minimum package isentropic efficiency	η <sub>Regr</sub> (package isentropic efficiency reference curve)	d (percentage loss reduction)
Rotary, lubricated, air- cooled, variable-speed compressor	$ \eta_{Regr} + (1 - \eta_{Regr}) * (d/100) $	$ \begin{array}{c} -0.01549*ln^2(0.4719*\\ V_1) + 0.21573*ln(0.4719\\ *V_1) + 0.00905 \end{array}$	5
Rotary, lubricated, liquid-cooled, variable- speed compressor	$\begin{array}{c} 0.02349 + \eta_{Regr} + (1 - \\ \eta_{Regr}) * (d/100) \end{array}$	$ \begin{array}{c} -0.01549* \ln^2(0.4719*\\ V_1) + 0.21573* \ln(0.4719\\ *V_1) + 0.00905 \end{array}$	5

Note:  $V_1$  = full-load actual volume flow rate, in cubic feet per minute ("cfm")

**Table 3: Fan Qualifying Criteria** 

Fan Equipment Family	Qualifying Criteria Minimum <i>FEI</i>
Axial inline fan	1.20
Centrifugal housed fan	1.15
Centrifugal unhoused fan	1.25
Centrifugal inline fan	1.10
Axial panel fan	1.25
PRV	1.10
Radial housed fan	1.15

Table 1: Pump Qualifying Criteria

Equipment Class*	Qualifying Criteria Maximum <i>PEI<sub>VL</sub></i>	Qualifying Criteria Minimum <i>ER**</i>
ESCC.1800.VL	0.48	52
ESCC.3600.VL	0.46	54
ESFM.1800.VL	0.46	54
ESFM.3600.VL	0.48	52
IL.1800.VL	0.46	54
IL.3600.VL	0.45	55
RSV.1800.VL	0.46	54
RSV.3600.VL	0.43	57
ST.1800.VL	0.53	47
ST.3600.VL	0.53	47

\*Equipment class designations consist of a combination (in sequential order separated by periods) of: (1) An equipment family (ESCC = end suction close-coupled, ESFM = end suction frame mounted/own bearing, IL = in-line, RSV = radially split, multistage, vertical, in-line diffuser casing, ST = submersible turbine; all as defined in section III; (2) nominal speed of rotation (1800 = 1800 rpm, 3600 = 3600 rpm); and (3) VL = variable load.



<sup>\*\*</sup> ER =  $(1-PEI_{VL})*100$ 

## | EPS Rebate Calculation

The rebate per EPS  $(R_E)$  is \$25 multiplied by the sum of the nameplate rated horsepower of the electric motor  $(P_m)$  and the electronic control  $(P_c)$ .

$$R_E(\$) = 25 \cdot (P_m + P_c)$$

Entities may receive up to a \$25,000 cap in aggregate EPS rebates per calendar year.

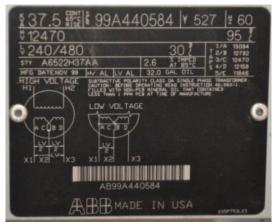


## **EPS Submission Requirements**

#### See statute and implementation guidance for full details

- 1. Description of the applicant.
- 2. Evidence the EPS is qualified.
- 3. Executive officer signature certifying application accuracy.

#### Nameplate



#### **Proof of Purchase**

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3	270-2500 500 kVA, Three Phase, Ri Primary Voltage: 12 kV C Secondary Voltage: 20k/ Per City of Lompoc Utility Specification #ELE-115, R (4 kV conversion project)	elta 120 Volt Wye Seconda Department Electric	iry	1.00	EA	\$11,382.00	\$11,382.00
4	270-4300 300 kVA, Three Phase, Ru Primary Voltage: 12 kV C Secondary Voltage: 486/ Per City of Lompoc Utility Specification #ELE-115, R (spare/co)	elta Primary 277 Volt Wye Seconda Department Electric	iry	1.00	EA	89,844.00	\$9,844.00
5	270-2800 1000 kVA, Three Phase, F Primary Voltage: 12 kV D	ladial Feed, Pad Mour elta Primary	t Transformer	1.00		\$20,782.00	\$20,782.00



## | Additional Information

Questions: <a href="mailto:DOERebates@icf.com">DOERebates@icf.com</a>

Application Portal: <a href="https://doerebates.my.site.com/rebates/s/?language=en\_US">https://doerebates.my.site.com/rebates/s/?language=en\_US</a>

EPS Program: <a href="https://www.energy.gov/mesc/extended-product-system-rebates">https://www.energy.gov/mesc/extended-product-system-rebates</a>

Transformer Program: <a href="https://www.energy.gov/mesc/energy-efficient-transformer-rebates">https://www.energy.gov/mesc/energy-efficient-transformer-rebates</a>

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#### Agenda

- Rebates Portal Overview
- Registration Overview
- Live Registration Demo
- Rebate Application Overview
  - Energy Efficient Transformer Rebates Program
  - Extended Product System Rebates Program
- Recap



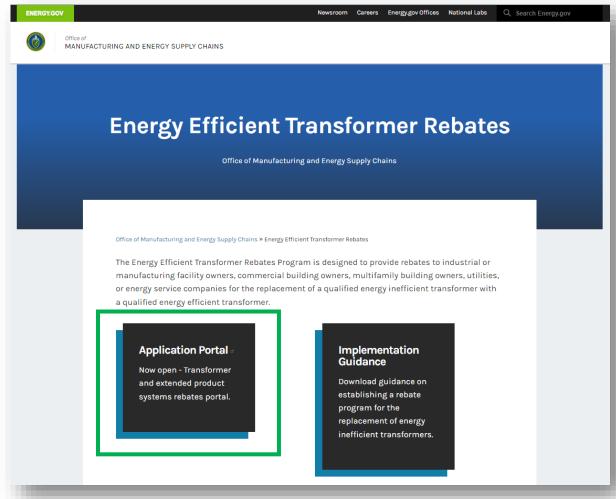




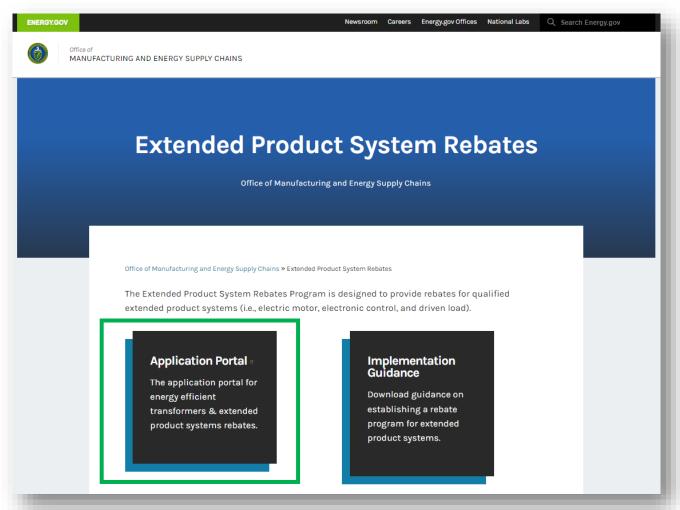


#### **Accessing the Rebates Portal**

The energy efficient transformers and EPS rebates portal (<u>doerebates.my.site.com/rebates</u>)
 can be accessed anytime through the DOE MESC website:







https://www.energy.gov/mesc/extended-product-system-rebates



#### **DOE Rebates Portal Overview**

- Single rebates portal for the two DOE MESC rebate programs (<a href="https://doerebates.my.site.com/rebates">https://doerebates.my.site.com/rebates</a>):
  - Energy Efficient Transformer Rebates Program
  - Extended Product System Rebates Program

#### Two step process:

- Register: Organization submits one-time registration to the Portal.
- 2. Apply: After confirming eligibility, organization will be able to submit rebate applications through the Portal.
- Applicants may visit the portal to check the application status and receive program updates.
- ICF helpdesk email for any questions or technical support on the registration or application process:



doerebates.my.site.com/rebates



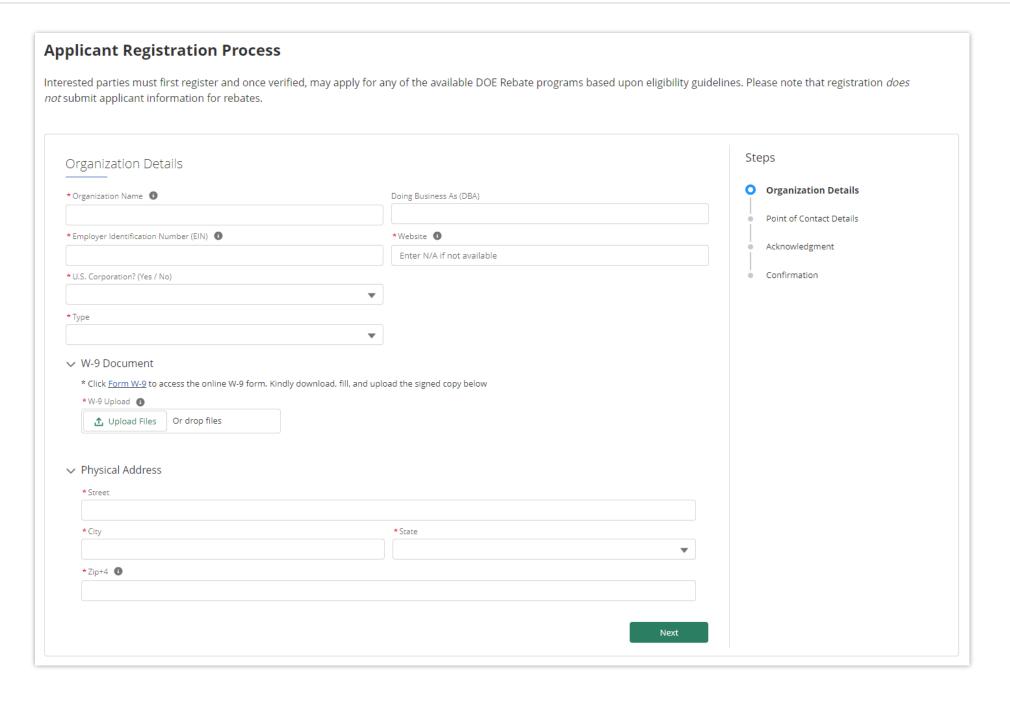




# Registration Overview

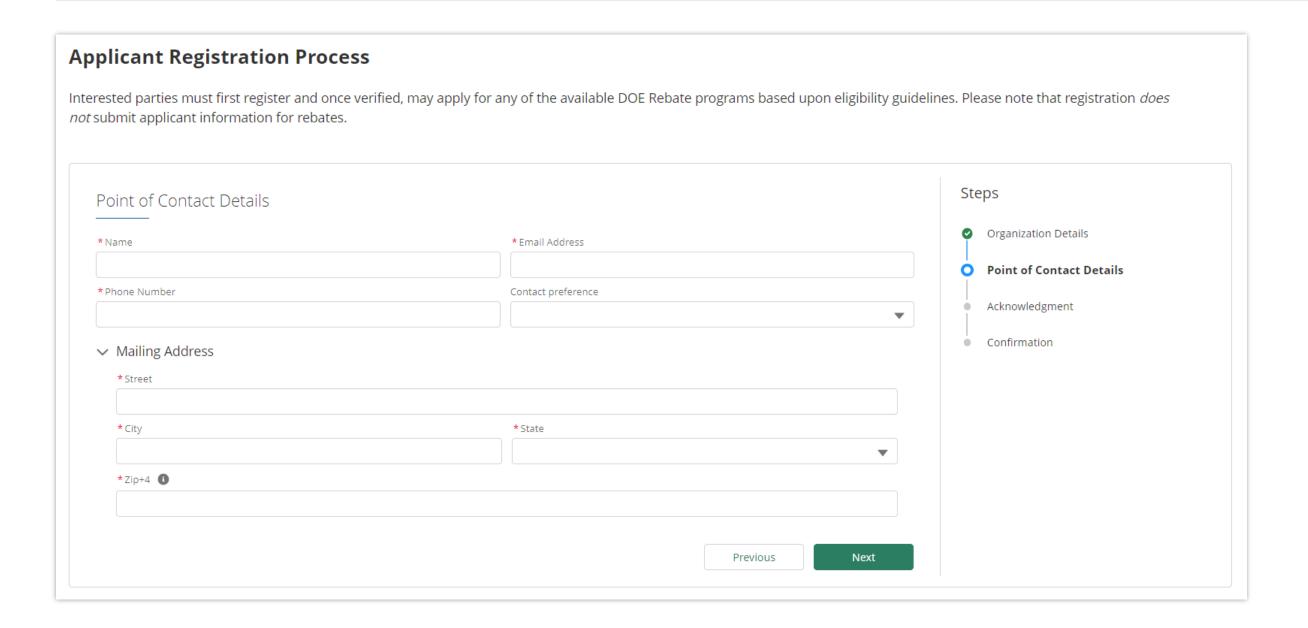


### Registration Process: Organization Details (input screen 1 of 3)



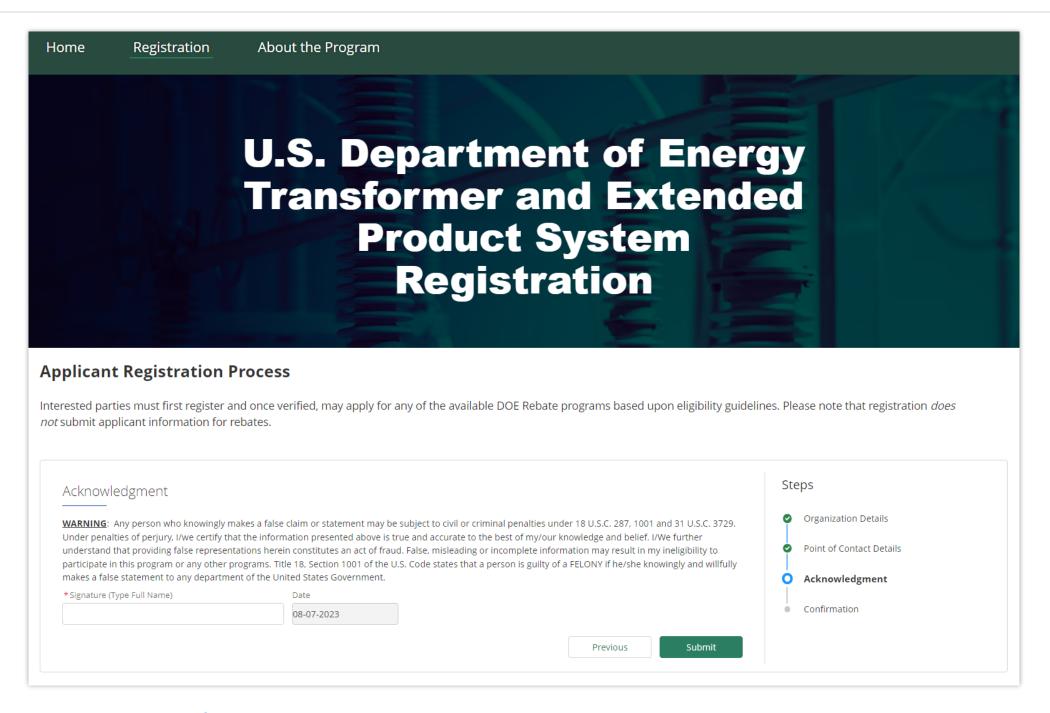


### Registration Process: Point of Contact Details (input screen 2 of 3)



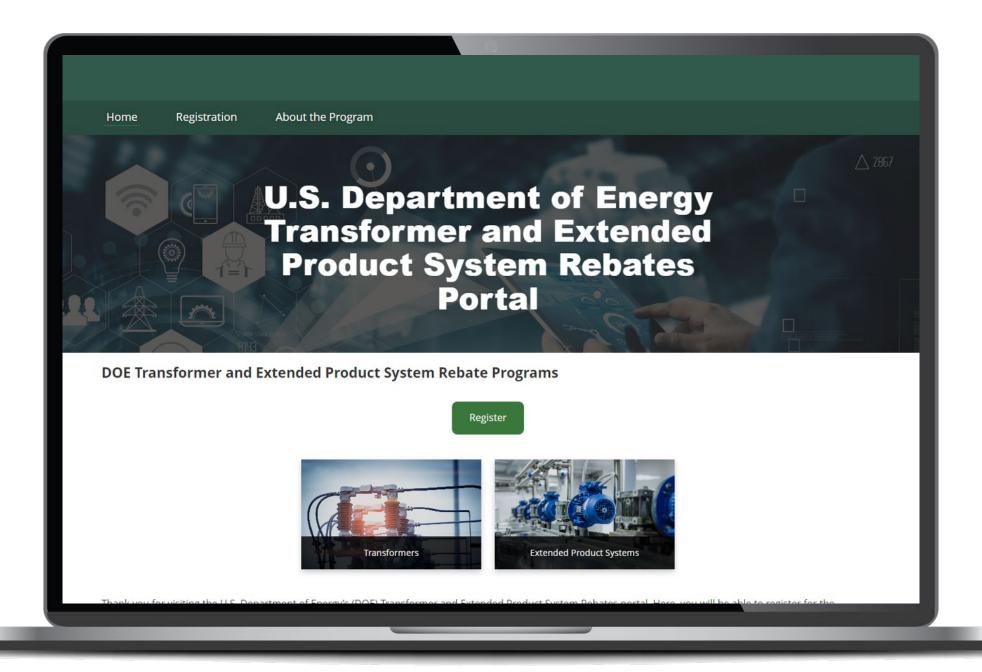


### Registration Process: Acknowledgement (input screen 3 of 3)





#### Rebates Portal Live Demo (5 min)





#### Organization Registration Vetting and Applications

#### Eligibility validation may include:

- Applicants are organizations (not individuals)
- Employer Identification Number (EIN) will be checked to match IRS records
- Check to ensure organization is not a sanctioned entity by the U.S. Treasury Office of Foreign Assets Control (OFAC)
- Consistent organizational details between provided EIN and SAM.gov Unique Entity ID (UEI, if provided)
- After confirming organizational eligibility, registrants will be emailed instructions to log into the application portal to submit rebate applications.







# Rebate Application Overview



**Energy Efficient Transformer Rebates Program Extended Product System Rebates Program** 

# Energy Efficient Transformer Rebate Applications: What You Will Need

Complete details can be found in the DOE Implementation Guidance document: <a href="https://www.energy.gov/mesc/energy-efficient-transformer-rebates">https://www.energy.gov/mesc/energy-efficient-transformer-rebates</a>

#### REQUIRED PRODUCT INFORMATION

(For qualified energy efficient transformers AND decommissioned inefficient transformers)

- Model number and serial number
- Year of manufacture
- kVa rating and voltage ratings
- Number of phases (1 or 3)
- Transformer type
  - Dry-type distribution
  - Liquid-immersed distribution
- For dry-type transformers, need Basic Impulse Level (BIL) rating
- Transformer core type
  - Amorphous electrical steel
  - Grain-oriented electrical steel
- Copy or image of transformer nameplate

#### REQUIRED DOCUMENTATION

(For purchase of qualified energy efficient transformer)

- Purchase date
- Installation Date
- Location of installation
  - Zip code and census tract
- Proof of eligible purchase
  - Copy of invoice/proof of payment of qualified energy efficient transformer
  - Certification that product is DOE compliant, including basic and individual model number
- Receipt or statement from manufacturer on transformer
  - Efficiency
  - Core loss value
  - Load loss value
  - Full-load loss value at the rated temperature
- Signed statement from authorized officer certifying that information in application is accurate

Rebates will be available until December 31, 2023, or until funds are exhausted.



# Extended Product System Rebate Applications: Air Compressors What You Will Need

Complete details can be found in the DOE Implementation Guidance document: <a href="https://www.energy.gov/mesc/extended-product-system-rebates">https://www.energy.gov/mesc/extended-product-system-rebates</a>

#### REQUIRED PRODUCT INFORMATION

(For qualified extended products: air compressors)

- Manufacturer, model number, and serial number
- Confirmation that air compressor meets qualifications and includes an electric motor (≥1 hp) with electronic controls
- Horsepower of electric motor (on nameplate)
- Confirmation that air compressor will operate
  - At least 2,000 hours/year and
  - At least 75% of the time at or below 70% of the full-load actual volume flow rate
- For purchasers of qualified air compressors, include the qualifying isotropic efficiency
- For owners of redesigned commercial/industrial machinery or equipment, provide description of prior controls and statement confirming they have been removed or disabled
- Copy or image of air compressor nameplate

#### REQUIRED DOCUMENTATION

(For qualified extended products: air compressors)

- Purchase date
- Installation date and copy of proof of installation (e.g., receipt/invoice/contract)
- Location of installation
  - Zip code and census tract
- Proof of eligible purchase
  - Copy of invoice/proof of payment of qualified extended product air compressor
  - Certification that product is DOE compliant, including basic and individual model number
- For purchasers, copy of manufacturer specification sheets including model number and efficiency rating (isotropic efficiency)
- Signed statement from authorized executive officer certifying that information in application is accurate



# Extended Product System Rebate Applications: Fans What You Will Need

Complete details can be found in the DOE Implementation Guidance document: <a href="https://www.energy.gov/mesc/extended-product-system-rebates">https://www.energy.gov/mesc/extended-product-system-rebates</a>

#### REQUIRED PRODUCT INFORMATION

(For qualified extended products: fans)

- Manufacturer, model number, and serial number
- Confirmation that fan meets qualifications and includes an electric motor (≥1 hp) with electronic controls
- Horsepower of electric motor (on nameplate)
- Confirmation that fan will operate
  - At least 2,000 hours/year and
  - At least 75% of the time at or below 75% of the maximum design flow
- For purchasers of qualified fans, include the Fan Energy Index (FEI)
- For owners of redesigned commercial/industrial machinery or equipment, provide description of prior throttling or bypass devices and a statement confirming they have been removed or disabled
- Copy or image of fan nameplate

#### REQUIRED DOCUMENTATION

(For qualified extended products: fans)

- Purchase date
- Installation date and copy of proof of installation (e.g., receipt/invoice/contract)
- Location of installation
  - Zip code and census tract
- Proof of eligible purchase
  - Copy of invoice/proof of payment of qualified extended product fan
  - Certification that product is DOE compliant, including basic and individual model number
- For purchasers, copy of manufacturer specification sheets including model number and Fan Energy Index (FEI)
  - Include documentation supporting the qualified FEI was calculated and verified according to AMCA 214–21



# Extended Product System Rebate Applications: Pumps What You Will Need

Complete details can be found in the DOE Implementation Guidance document: <a href="https://www.energy.gov/mesc/extended-product-system-rebates">https://www.energy.gov/mesc/extended-product-system-rebates</a>

#### REQUIRED PRODUCT INFORMATION

(For qualified extended products: pumps)

- Manufacturer, model number, and serial number
- Confirmation that pump meets qualifications and includes an electric motor (≥1 hp) with electronic controls
- Horsepower of electric motor (on nameplate)
- Confirmation that pump will operate
  - At least 2,000 hours/year and
  - At least 75% of the time at or below 75% of the maximum design flow
- For purchasers of qualified pumps, include the variable load pump energy index (PEIVL)
- For owners of the redesigned commercial/ industrial machinery or equipment, provide description of prior throttling or bypass devices and statement confirming they have been removed or disabled
- Copy or image of pump nameplate

#### REQUIRED DOCUMENTATION

(For qualified extended products: pumps)

- Purchase date
- Installation date and copy of proof of installation (e.g., receipt/invoice/contract)
- Location of installation
  - -Zip code and census tract
- Proof of eligible purchase
  - Copy of invoice/proof of payment of qualified extended product pump
  - Certification that product is DOE compliant, including basic and individual model number
- For purchasers, copy of manufacturer specification sheets including model number and variable load pump energy index (PEIVL)
  - Include a copy of the pump energy rating label or certificate



#### Recap

- Rebates Portal is now open for registration:
  - Energy Efficient Transformer Rebates Program
  - Extended Product System Rebates Program
- **Transformers**: Entities may initially receive up to a \$25,000 cap in aggregate transformer rebates, which may be raised at DOE's discretion.
  - DOE program page: <a href="mailto:energy-efficient-transformer-rebates">energy.gov/mesc/energy-efficient-transformer-rebates</a>.
- Extended Product Systems (EPS): Entities may receive up to a \$25,000 cap in aggregate EPS rebates that will be distributed based on when applications are received, until the exhaustion of funds.
  - DOE program page: energy.gov/mesc/extended-product-system-rebates.



doerebates.my.site.com/rebates

Any questions? Please email <a href="DOERebates@icf.com">DOERebates@icf.com</a>

Go to the Portal now to register your organization and then submit your application(s)!





#### Portal URL:

doerebates.my.site.com/rebates

Any questions, please email:

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twitter.com/icf

f https://www.facebook.com/ThisIsICF/

#### icf.com

#### **About ICF**

ICF (NASDAQ:ICFI) is a global consulting and digital services company with over 9,000 full- and part-time employees, but we are not your typical consultants. At ICF, business analysts and policy specialists work together with digital strategists, data scientists and creatives. We combine unmatched industry expertise with cutting-edge engagement capabilities to help organizations solve their most complex challenges. Since 1969, public and private sector clients have worked with ICF to navigate change and shape the future.