

# **City of Columbia Water & Light Advisory Board**

**February 20, 2007**



## **Net Metering & Interconnection**

**By Warren Wood, PE**

**Director, Utility Operations Division**

**Missouri Public Service Commission - Staff**



# *Topics*

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## **1. Legislation**

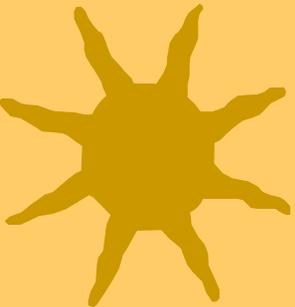
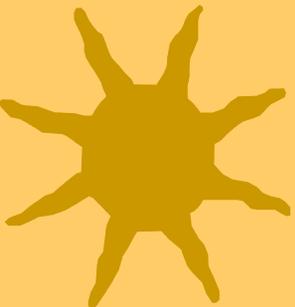
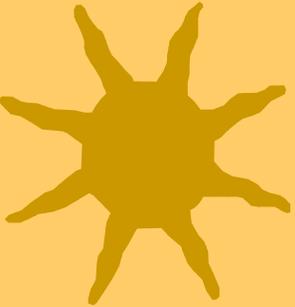
**Section 386.887 RSMo Supp 2002**

## **2. Commission Rule**

**Net Metering Rule 4 CSR 240 - 20.065**

## **3. Interconnection Equipment**

## **4. EPAct Net Metering & Interconnection Provisions**



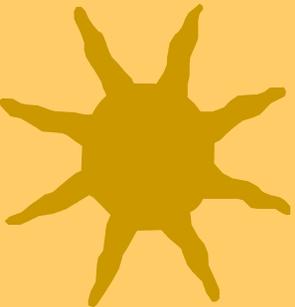
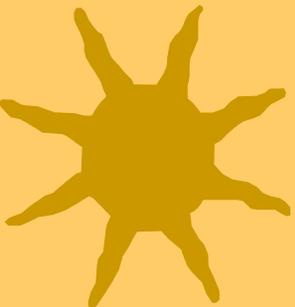
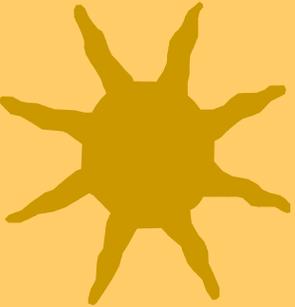


# *Net Metering Legislation*

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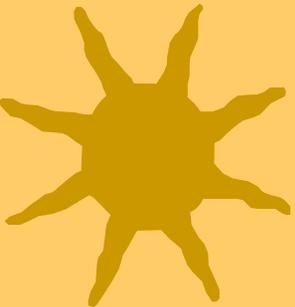
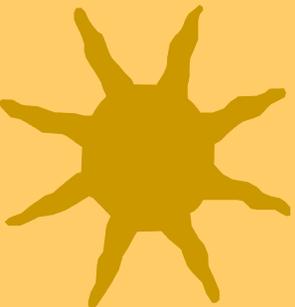
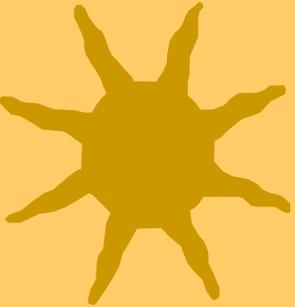
## **Legislation:**

Following the 2001-2002 legislative session, the governor signed into law Section 386.887 (RSMo 2002 Supp) – the “Consumer Clean Energy Act”. The provisions of this legislation (HB 1402) were hotly debated by numerous parties due to the limitations that this legislation contained that largely mimic the Public Utility Regulatory Policy Act (PURPA) regarding interconnection of alternative energy sources and appropriate compensation for excess generation.





# *Net Metering Legislation*



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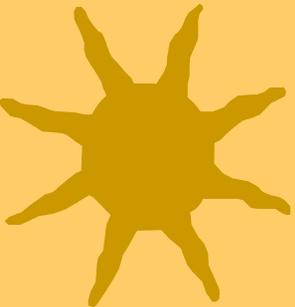
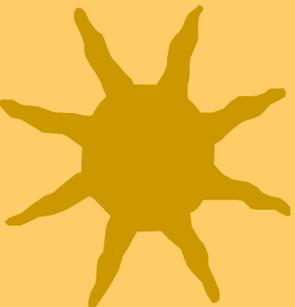
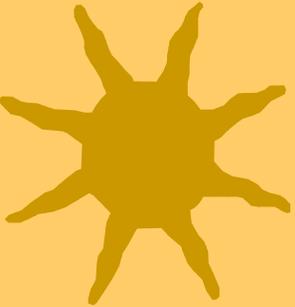
## Section 386.887 “Consumer Clean Energy Act”

- Permits interconnection of customer-generators with systems below 100 kW in size that are a hydrogen fuel cell or powered by sun, wind or biomass.
- Permits interconnection with all “retail electric suppliers” including IOUs, munis and coops.
- Requires measurement of power delivered to grid by customer generator and delivered to customer-generator by supplier separately.
- Applies retail rates (~0.08 \$/kWh) to customer generator supplied power and avoided rates (~0.02 \$/kWh) to customer generator delivered power.



# *Net Metering Legislation*

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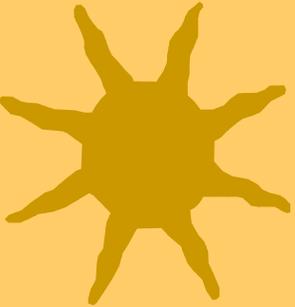
## “Consumer Clean Energy Act” – continued

- Limits participation to the lesser of 0.1% of previous year peak or 10,000 kW.
- Requires adherence to safety standards established by PSC, NESC, IEEE, UL and all reasonable standards and requirements established by retail electric supplier.
- Requires customer-generator to obtain liability insurance in amount set by PSC.
- Requires PSC development of a contract for transactions between the customer-generator and retail electric supplier.

*I can forward a copy of the complete text of this statute if you are interested.*

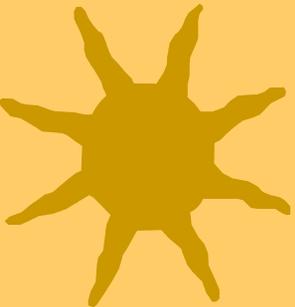
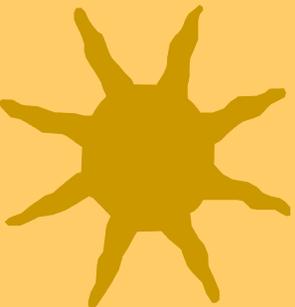


# *Missouri PSC Rules*



## **Rule 4 CSR 240-20.065:**

RSMO Section 386.887 required that the PSC develop rules for interconnection related to safety, contracts, certification and liability insurance. Technical conferences including representatives from a broad array of interest were active in these working meetings. The final outcome of these meetings was rule 4 CSR 240-20.065.



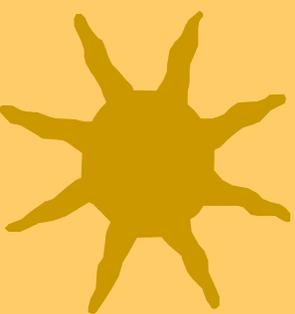
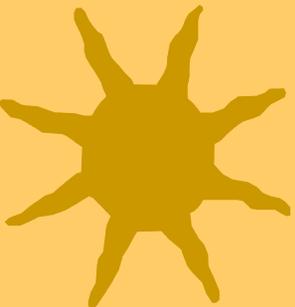
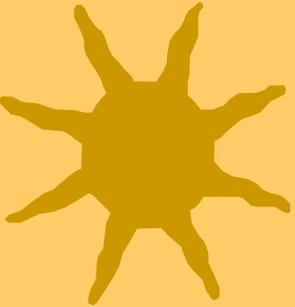


# *Missouri PSC Rules*

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## 4 CSR 240-20.065 “Net Metering”

- Duplicates much of RSMo 386.887 in PSC rules.
- Implements \$100,000 liability insurance requirement.
- Creates contract for transactions between retail electric supplier and consumer generator.
- Contract Provisions Include:
  - Installation/Hardware Compliance
  - Operation/Disconnection/Termination Rights
  - Transfer of Ownership
  - Dispute Resolution





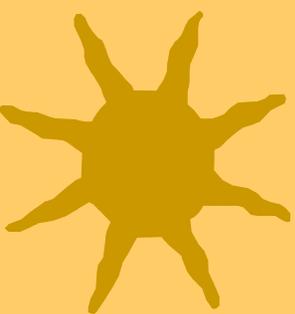
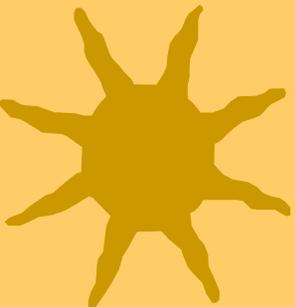
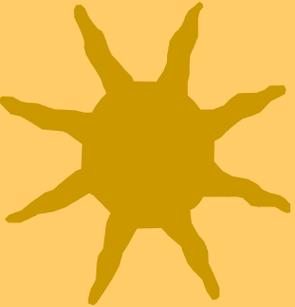
# *Missouri PSC Rules*

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## “Net Metering” – continued

- Contract Provisions – continued
  - Inspection and Certification
  - Testing Recording & Reporting Requirements

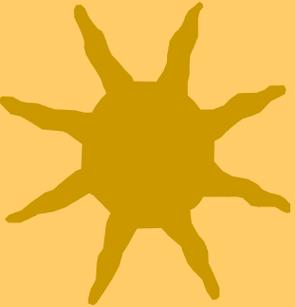
*I have a copy of this rule, including the contract, if you are interested.*





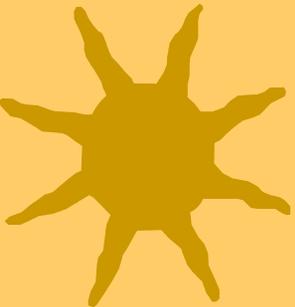
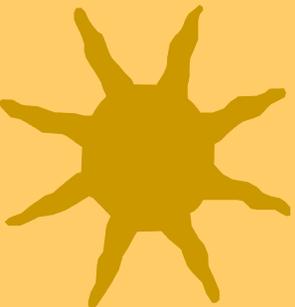
# *Interconnection Equipment*

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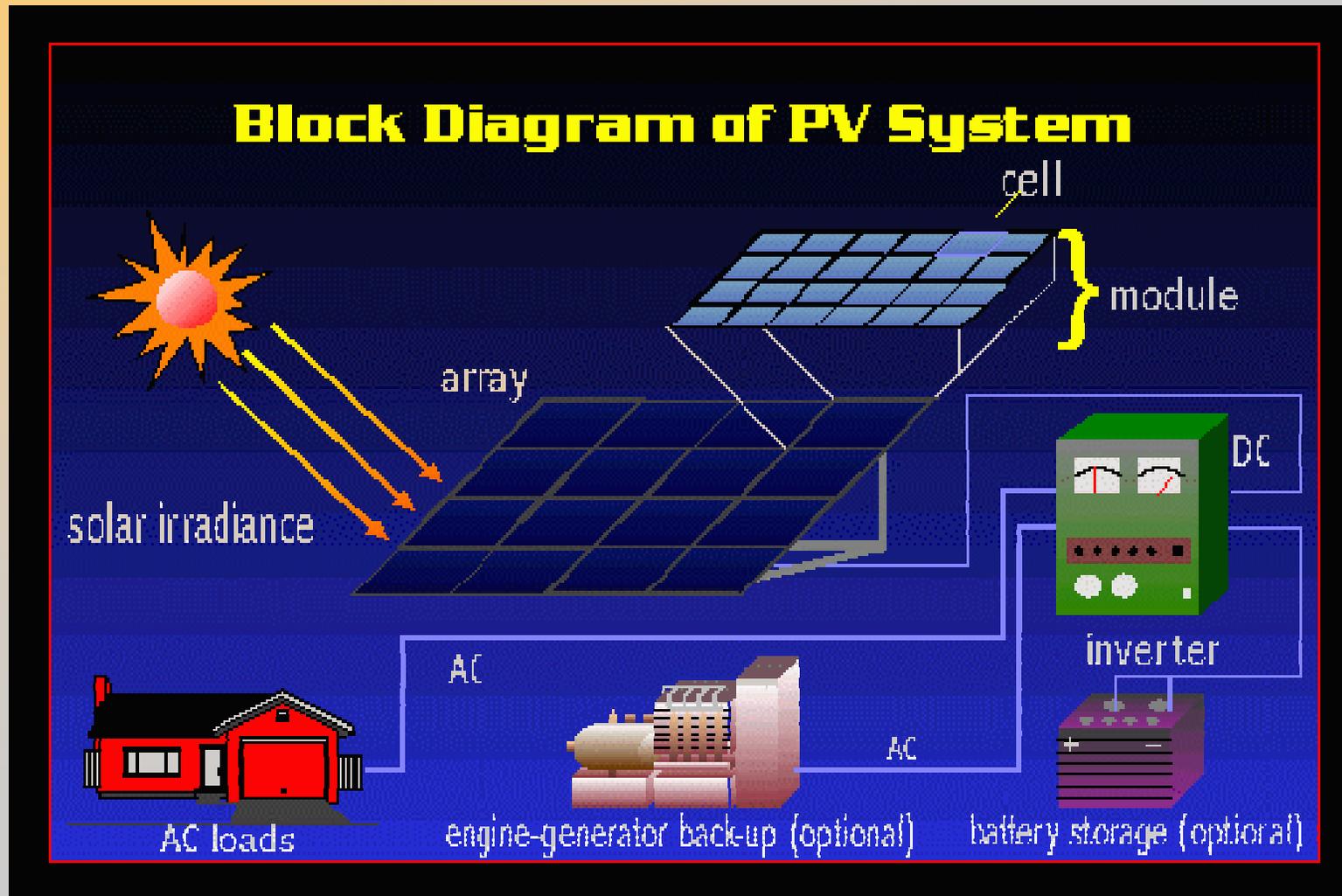
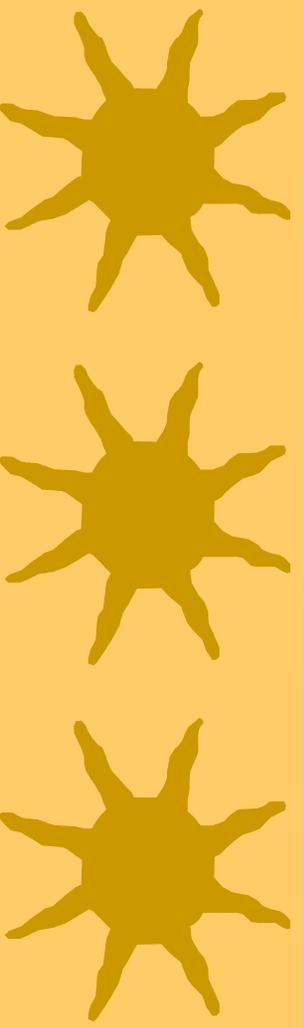
## **Interconnection Equipment:**

- Energy source and conversion to electricity.
- Inverter for alternating current conversion, synchronization, isolation, and safety.
- Isolation switch for disconnect from power panel.
- Optional meter for measuring power generated.
- Optional batteries for energy storage and backup power.
- Optional alternative energy source for backup power.



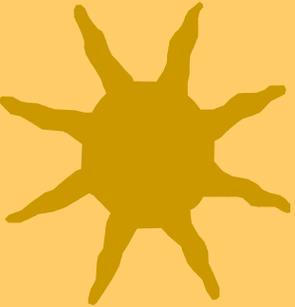


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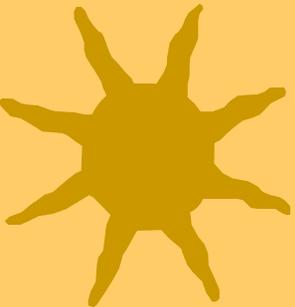
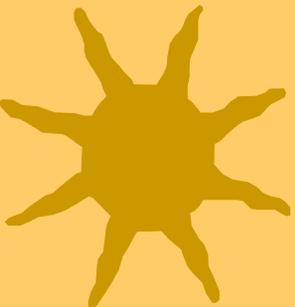




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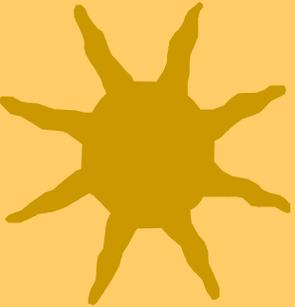


Example Projects: Governor Office Building

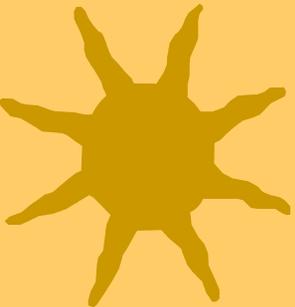
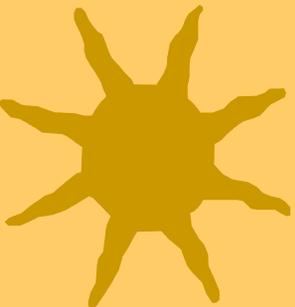




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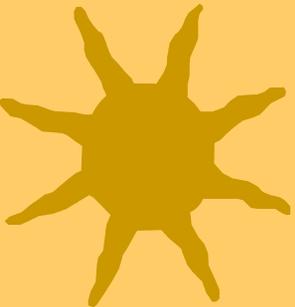
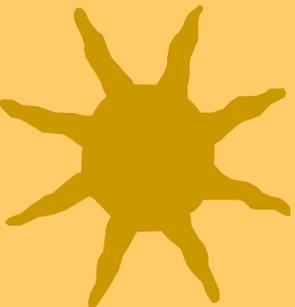
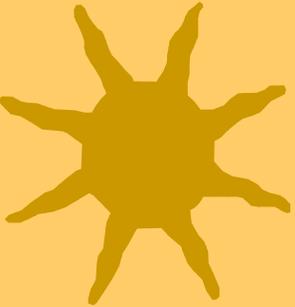


Inverter





# *Interconnection Equipment*

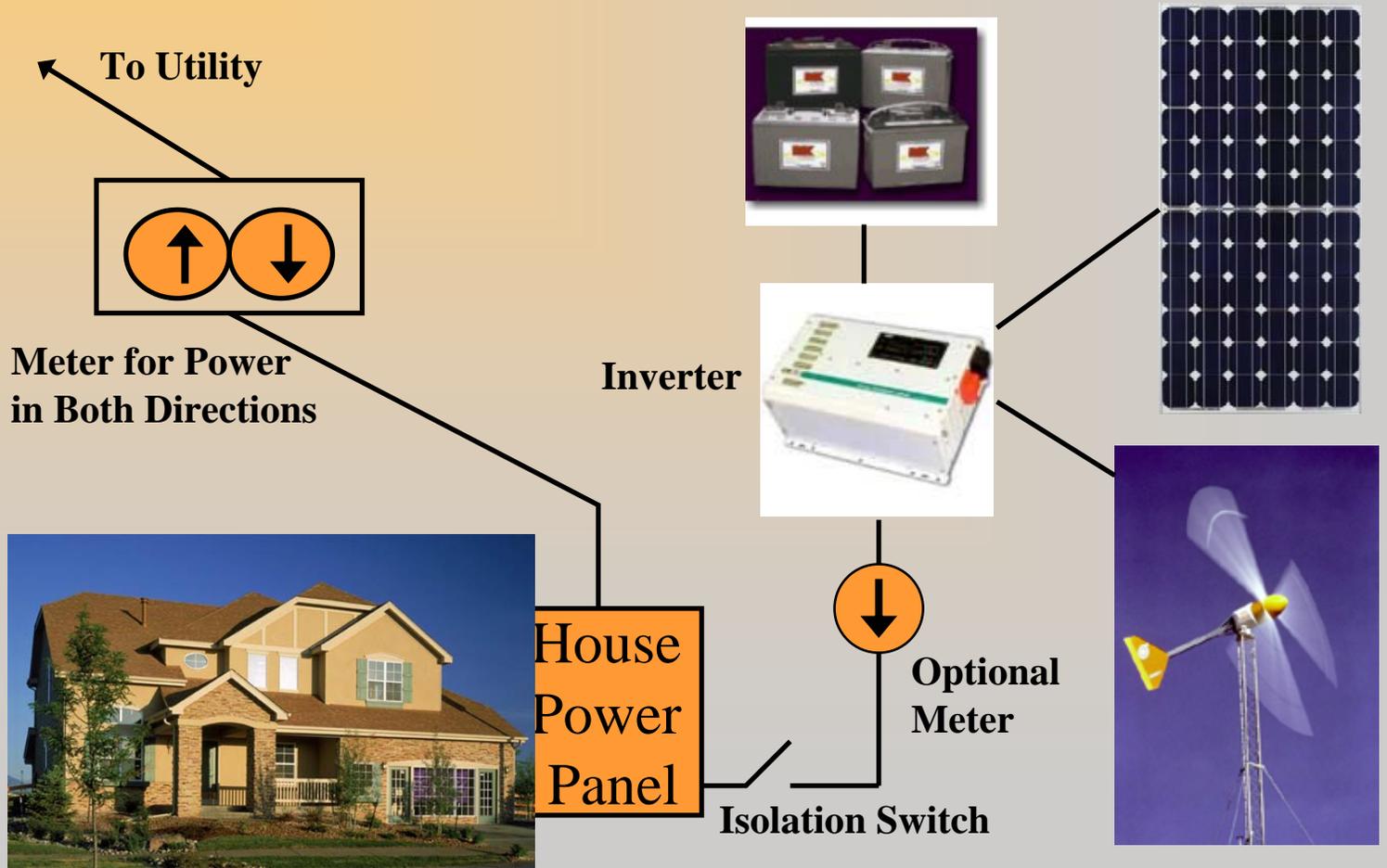
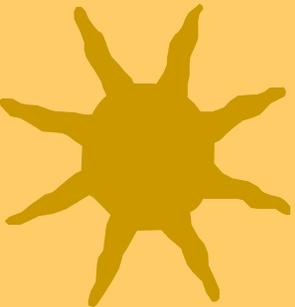
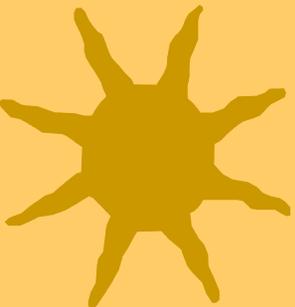
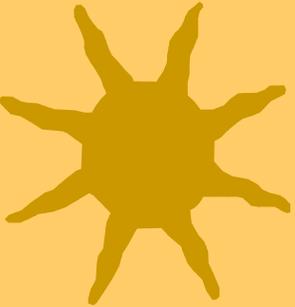


Isolation Switch





# Interconnection Equipment



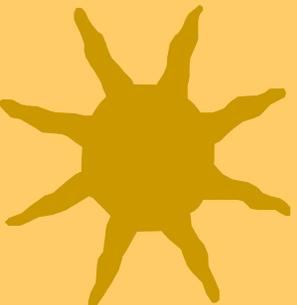
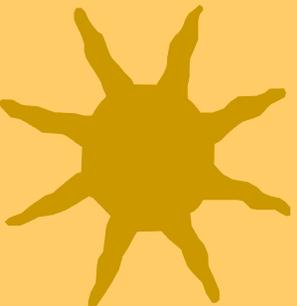
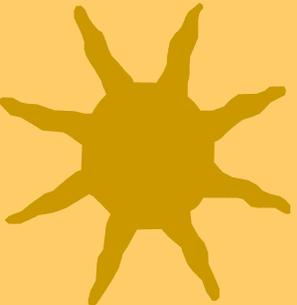


# *EPAct Net Metering Provisions*

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## Section 1251 – PURPA Section 111(d) Amendment

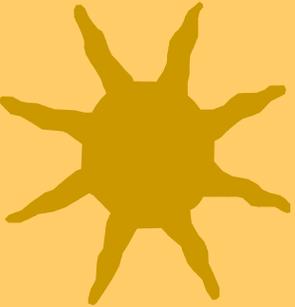
(11) NET METERING – Each electric utility shall make available upon request net metering service to any electric consumer that the electric utility serves. For purposes of this paragraph, the term ‘net metering service’ means service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period.





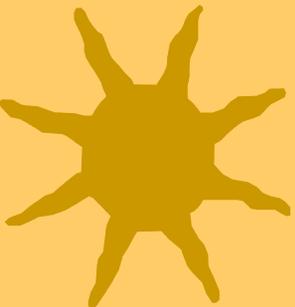
# *EPAct Net Metering Provisions*

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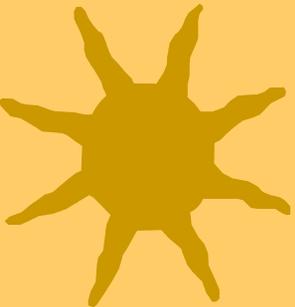


## Time Limitations:

Not later than 2 years after the enactment of this paragraph, each State regulatory authority and each nonregulated electric utility shall commence the consideration referred to in section 111, or set a hearing date for such consideration.



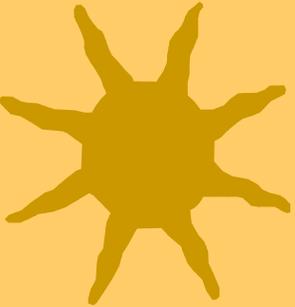
Not later than 3 years after enactment of this paragraph, each State regulatory authority, and each nonregulated electric utility, shall complete the consideration, and shall make a determination regarding each standard.





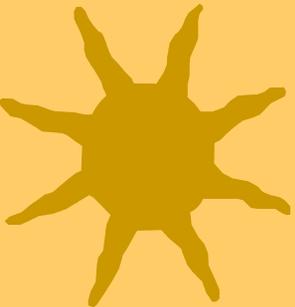
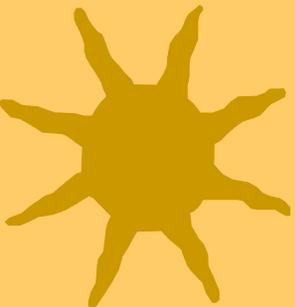
# *EPAct Net Metering Provisions*

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Prior State Action (for section to not apply):

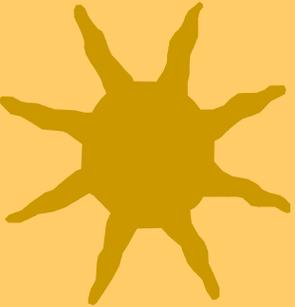
- (1) The State has implemented for such utility the standard concerned (or a comparable standard);
- (2) The State regulatory authority for such State or relevant nonregulated electric utility has conducted a proceeding to consider implementation of the standards concerned (or a comparable standard); or
- (3) the State Legislature has voted on the implementation of such standard (or a comparable standard).



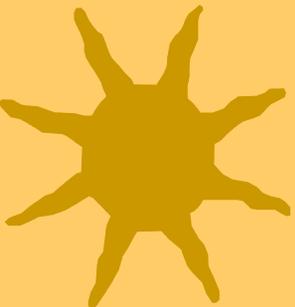


# *EPAct Interconnection Provisions*

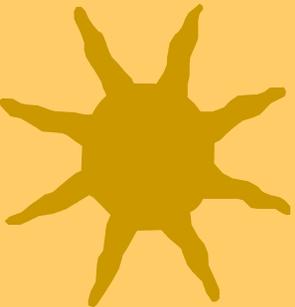
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## Section 1254 – PURPA Section 111(d) Amendment



(15) INTERCONNECTION – Each electric utility shall make available, upon request, interconnection service to any electric consumer that the electric utility serves. For purposes of this paragraph, the term ‘interconnection service’ means service to an electric consumer under which an on-site generating facility on the consumer’s premises shall be connected to the local distribution facilities. Interconnection services shall be offered based upon the standards developed by the Institute of Electrical and Electronics Engineers: IEEE Standard 1547 for Interconnecting Distributed Resources with Electric Power Systems, as they may be amended from time to time.





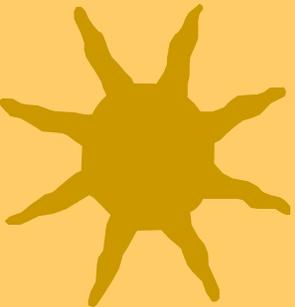
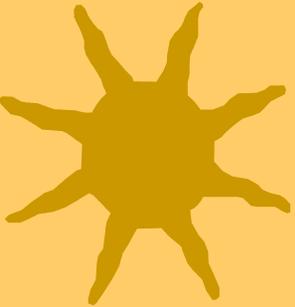
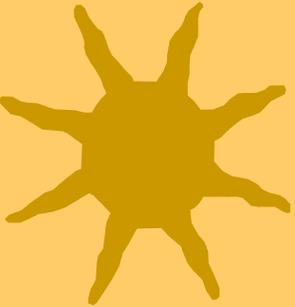
# *EPAct Interconnection Provisions*

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Section 1254 – PURPA Section 111(d) Amendment

(15) INTERCONNECTION – continued

In addition, agreements and procedures shall be established whereby the services offered shall promote current best practices of interconnection for distributed generation, including but not limited to practices stipulated in model codes adopted by associations of state regulatory agencies. All such agreements and procedures shall be just and reasonable, and not unduly discriminatory or preferential.





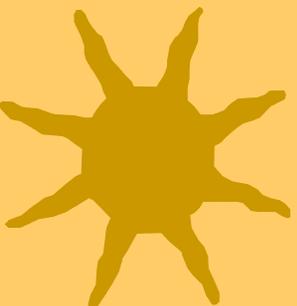
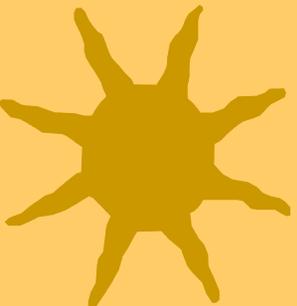
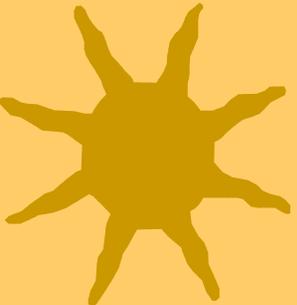
# *EPA Act Interconnection Provisions*

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## Time Limitations:

Not later than 1 year after the enactment of this paragraph, each State regulatory authority and each nonregulated electric utility shall commence the consideration referred to in section 111, or set a hearing date for such consideration.

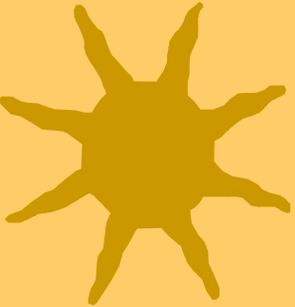
Not later than 2 years after enactment of this paragraph, each State regulatory authority, and each nonregulated electric utility, shall complete the consideration, and shall make a determination regarding each standard.





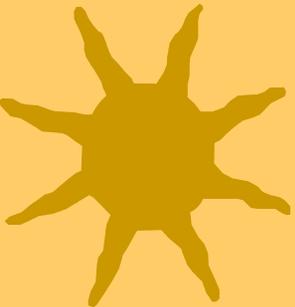
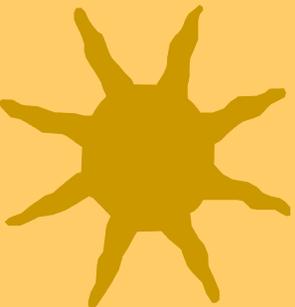
# *EPAct Interconnection Provisions*

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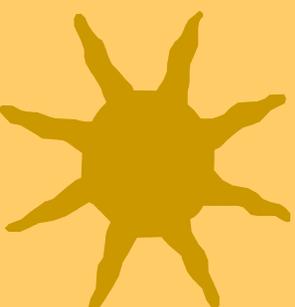
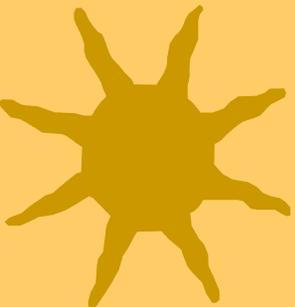
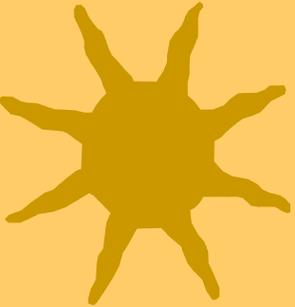
# *EPAct Interconnection Provisions*

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Note difference in IEEE Standards:

EPAct Refers to IEEE Standard 1547 for Interconnecting Distributed Resources with Electric Power Systems

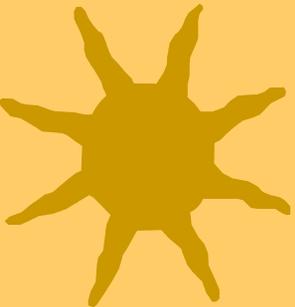
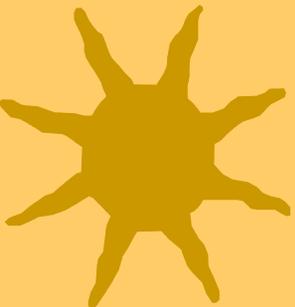
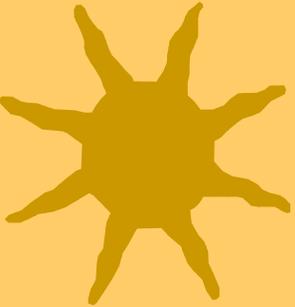
Current PSC Rule Refers to IEEE Standard 929-2000 and UL 1741.





## Contact Information:

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