Department of Public Service Response to S.267

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Director of Planning

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Power Supply Requirements in Vermont

2005 – Sustainably Priced Energy Enterprise Development Program

2009 – Standard Offer Program

2015 – Renewable Energy Standard

"Power supply questions now revolve around the most cost-effective way to meet the RES requirements, not around how much renewable energy to acquire."

– 2016 Comprehensive Energy Plan at 277.

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Renewable Generation in Vermont

Technology	MW
Solar	364
Hydroelectric	200
Wind	151
Biomass	74
Landfill gas	11
Anaerobic digesters	8
Total	**808**

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Components of Tier II Compliance

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Tier II Requirement = Solar

- 95% of Tier II compliance in 2018 was solar
- Limited likelihood of significant new resources other than solar
  - Hydro = limited options for siting
  - Small wind = more than twice the cost of solar
  - Anaerobic digesters = more than twice the cost of solar

Region-Wide Distributed Solar

- 7,740 % increase in solar in New England from 2010 through 2019
- Vermont = 4% of load; 11% of solar
- Regional forecast of 7,726 MW in 2029

State	Installed Capacity (MW_{AC})	No. of Installations
Massachusetts*	2,180.45	102,381
Connecticut	566.53	44,514
Vermont*	364.24	13,863
New Hampshire	105.24	9,587
Rhode Island	159.75	7,776
Maine	56.32	5,387
New England	**3,432.53**	**183,508**

Source: ISO-NE December 2019 DG Survey Results. https://www.iso-ne.com/static-assets/documents/2020/02/pv_survey_results_021420.pdf

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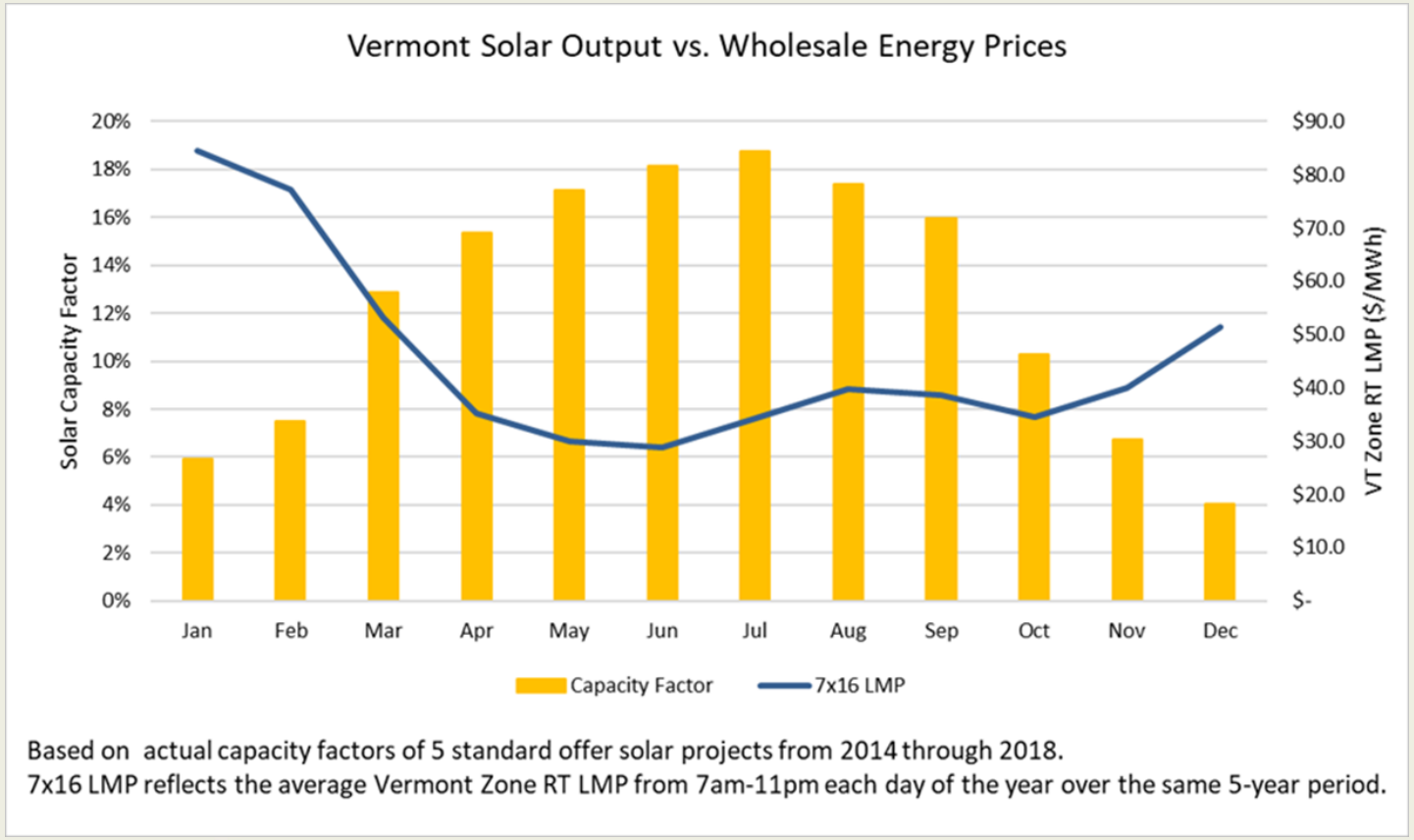
Value of Solar – Wholesale Energy



Based on actual capacity factors of 5 standard offer solar projects from 2014 through 2018.
7x16 LMP reflects the average Vermont Zone RT LMP from 7am-11pm each day of the year over the same 5-year period.

- Solar has successfully depressed wholesale energy price during sunny days
- Most price exposure happens during winter

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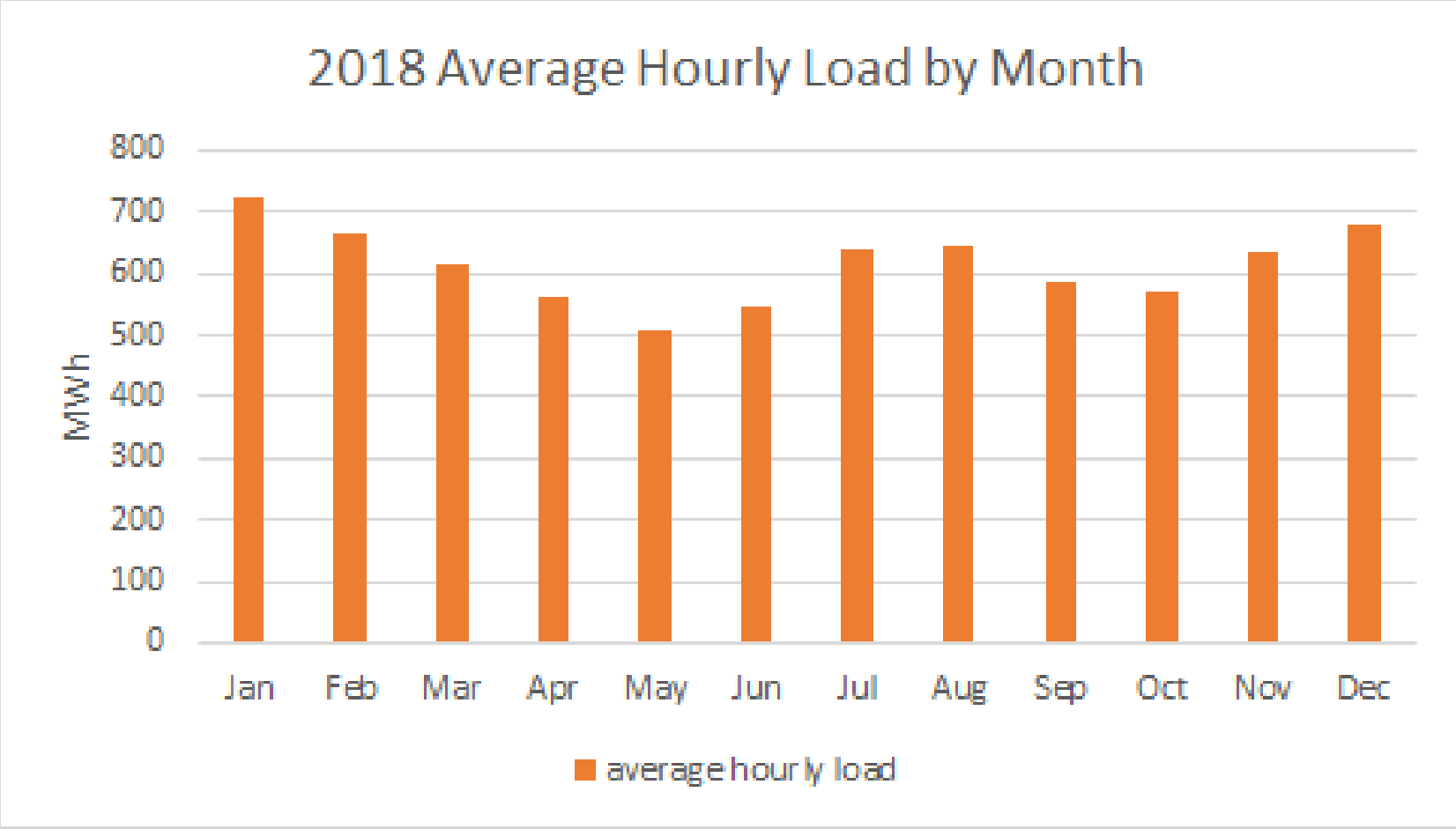
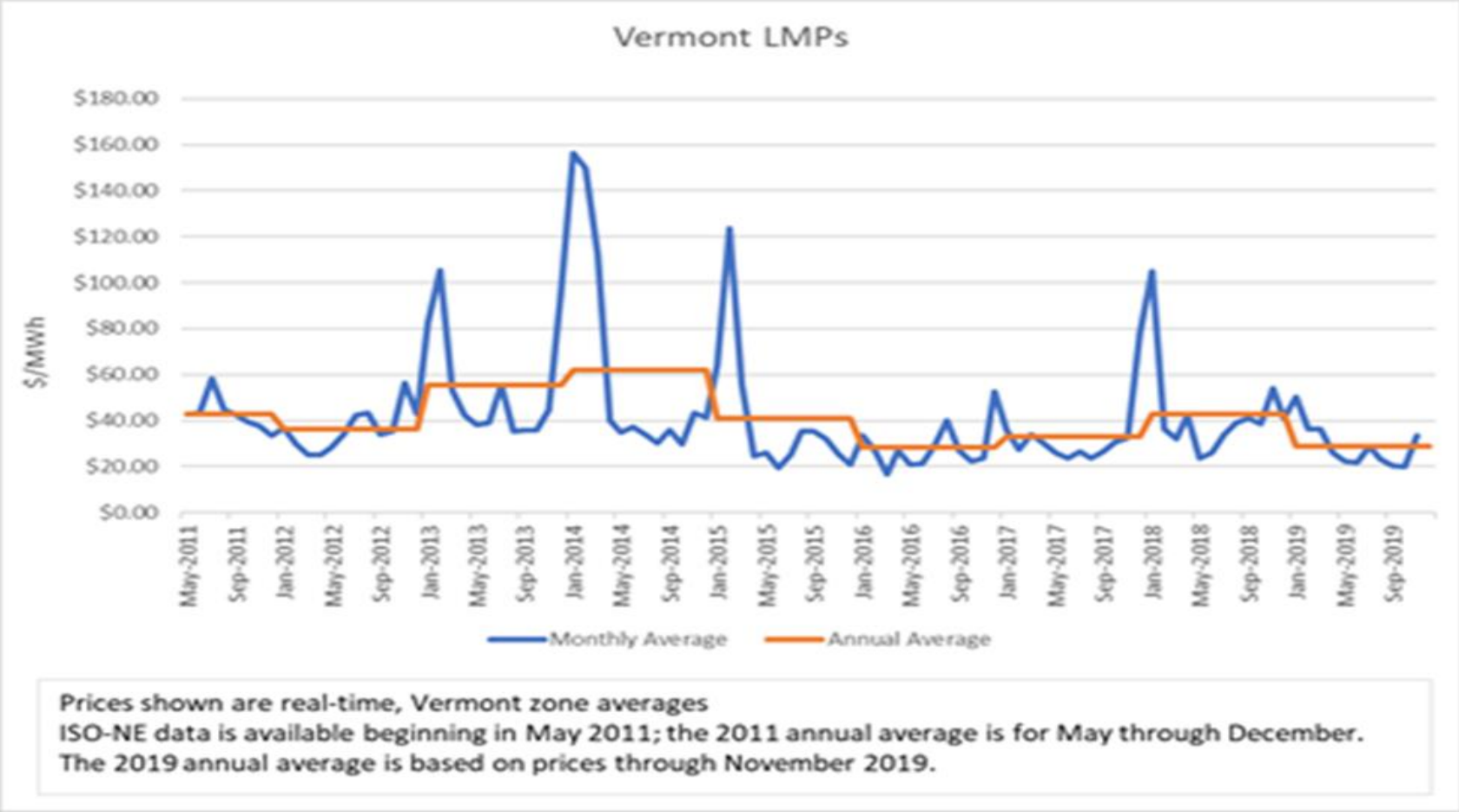
Vermont Average Loads



New England Wholesale Prices Spike in Winter



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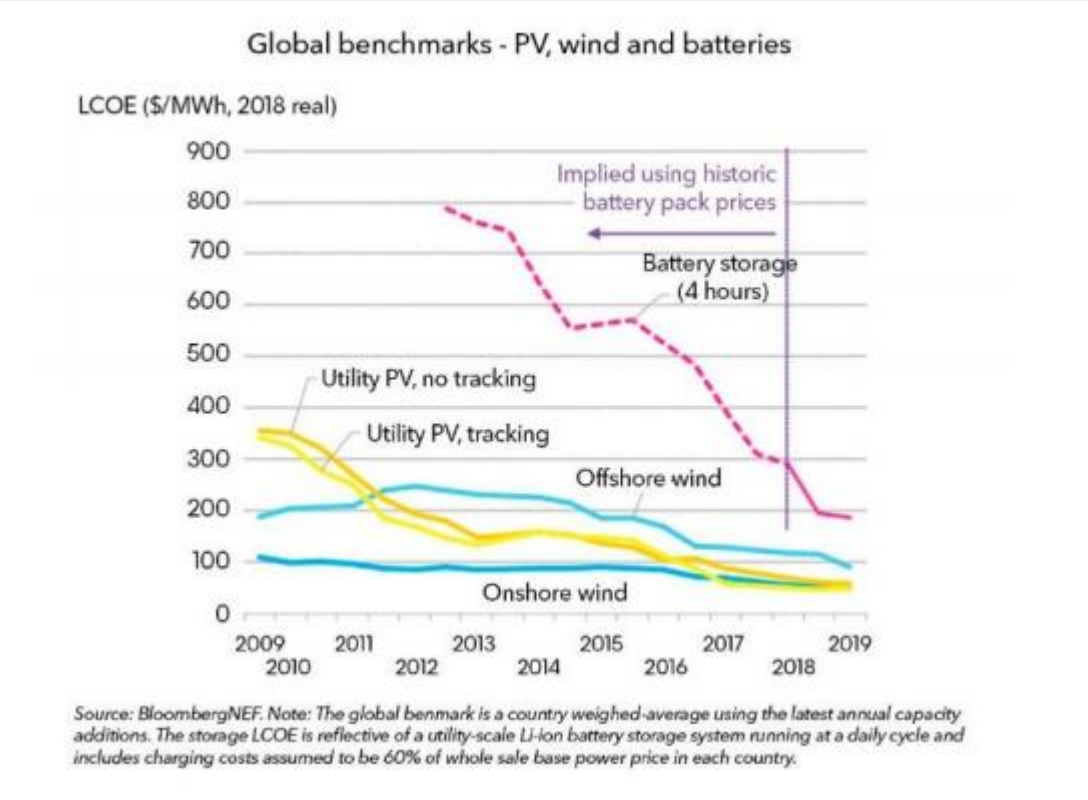
Value of Solar – Grid Benefits

- Solar has successfully pushed Vermont peak to after dark
- Increasing number of generation constrained areas
- Load increases expected primarily in winter
- Distributed solar has minimal grid value compared to 10 years ago

Promise & Limitations of Storage

- Very useful with peak reduction, not with moving excess solar to winter
- Residential storage = resilience for homeowner, some peak reduction value



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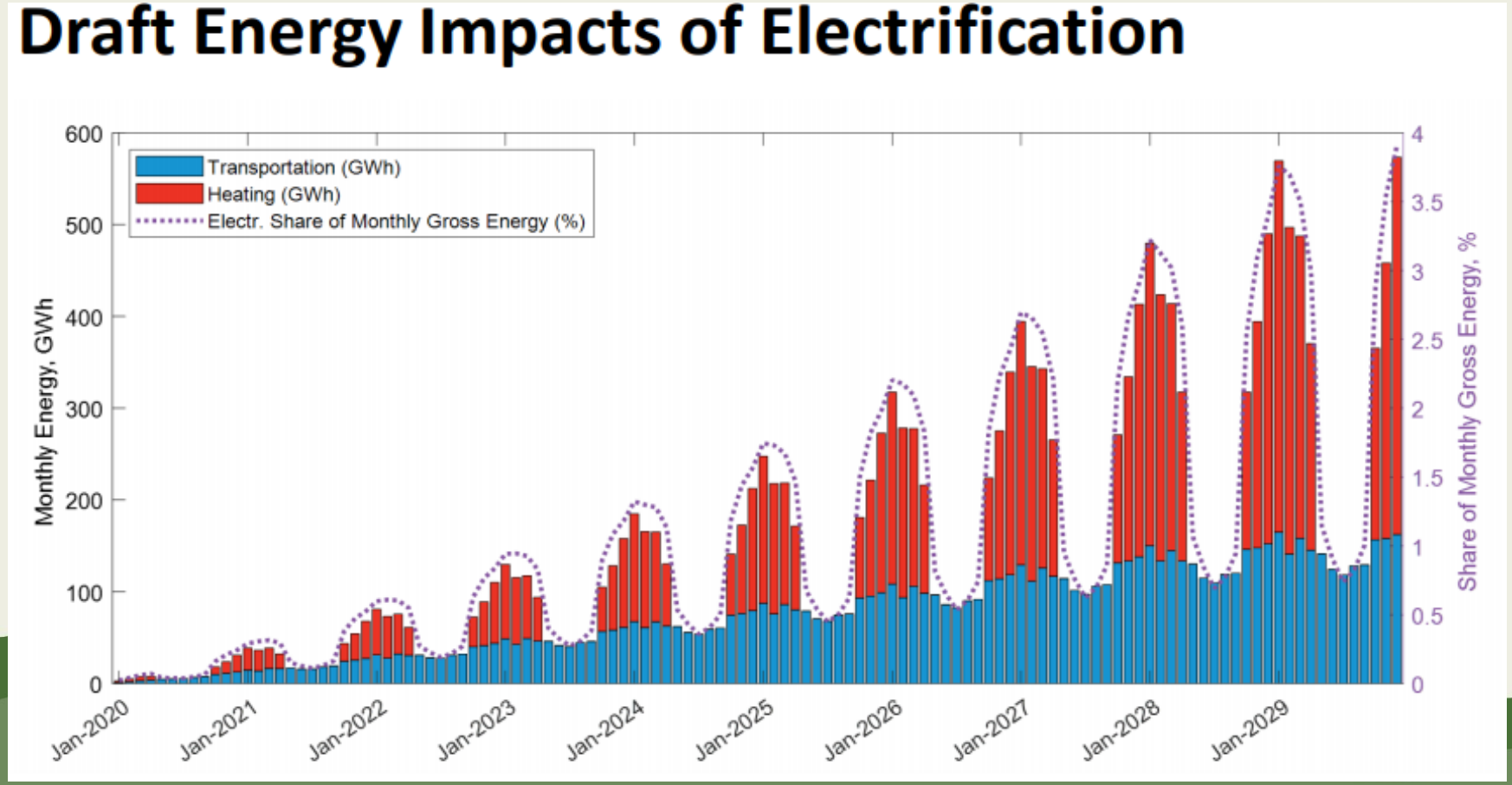
Electrification will primarily impact winter load



Source: ISO-NE Load Forecast Committee. https://www.iso-ne.com/static-assets/documents/2019/12/draft_2020_energy.pdf

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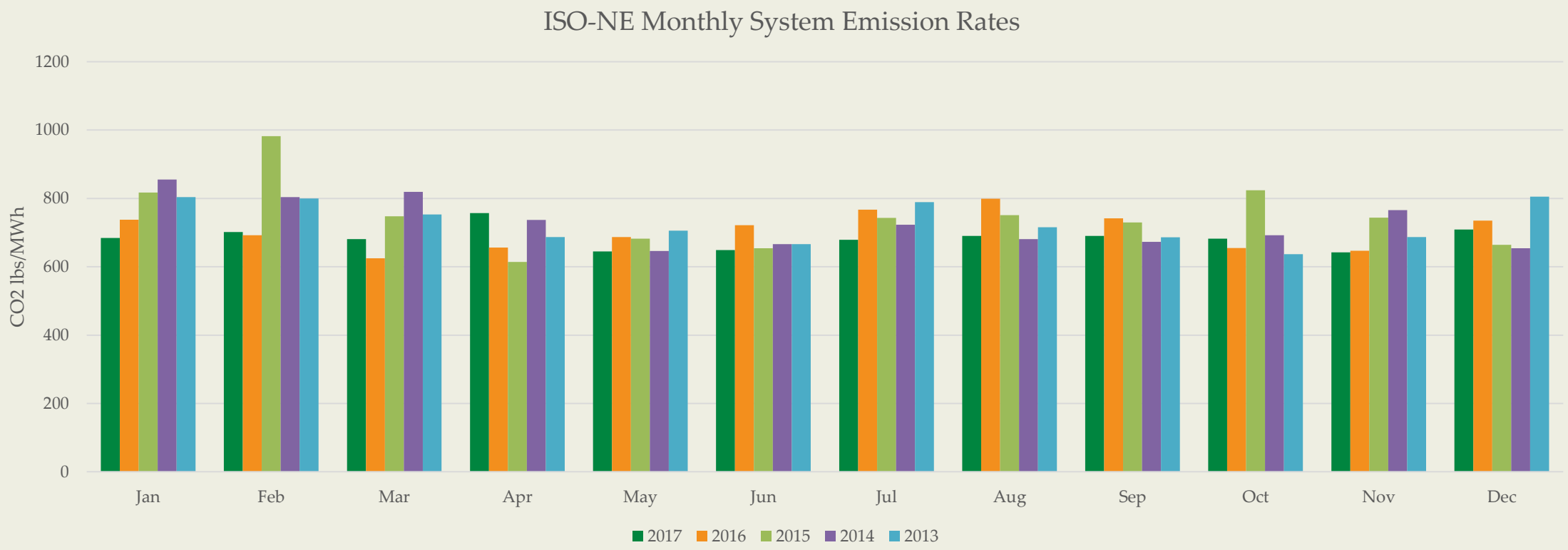
Value of Solar – Emissions Reductions



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Solar Required by Tier II

- Vermont solar under existing Tier II requirement
  - 109 MW non-Tier II compliant
  - 100 MW NM 1.0 (post 7/1/15) Tier II compliant net metering but customer/developer owns RECs
  - 152 MW Tier II compliant with utilities receiving RECs
  - 328 MW new Tier II compliant necessary
- 689 MW total solar needed in 2032

  (assuming no NM 1.0 used to comply)

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10% Tier II Compliance Costs

- 2018: 1.6% retail sales; $2.57 Million
  - Represents the costs of retiring renewable energy credits

- Estimated compliance with 10% retail sales in 2032 =

  $ 7.5 Million to $27 Million in 2032

20% Tier II Compliance Costs

- Estimated $15 Million to $53 Million in 2030

- Much more difficult to estimate
- Costs need to account for costs of paying Alternative Compliance Payment, cost of upgrading infrastructure, cost of storage

Electric Customers are Not a Piggy Bank

Least-cost planning

- meeting the public's need for energy services, after safety concerns are addressed, at the lowest present value life cycle cost, including environmental and economic costs,

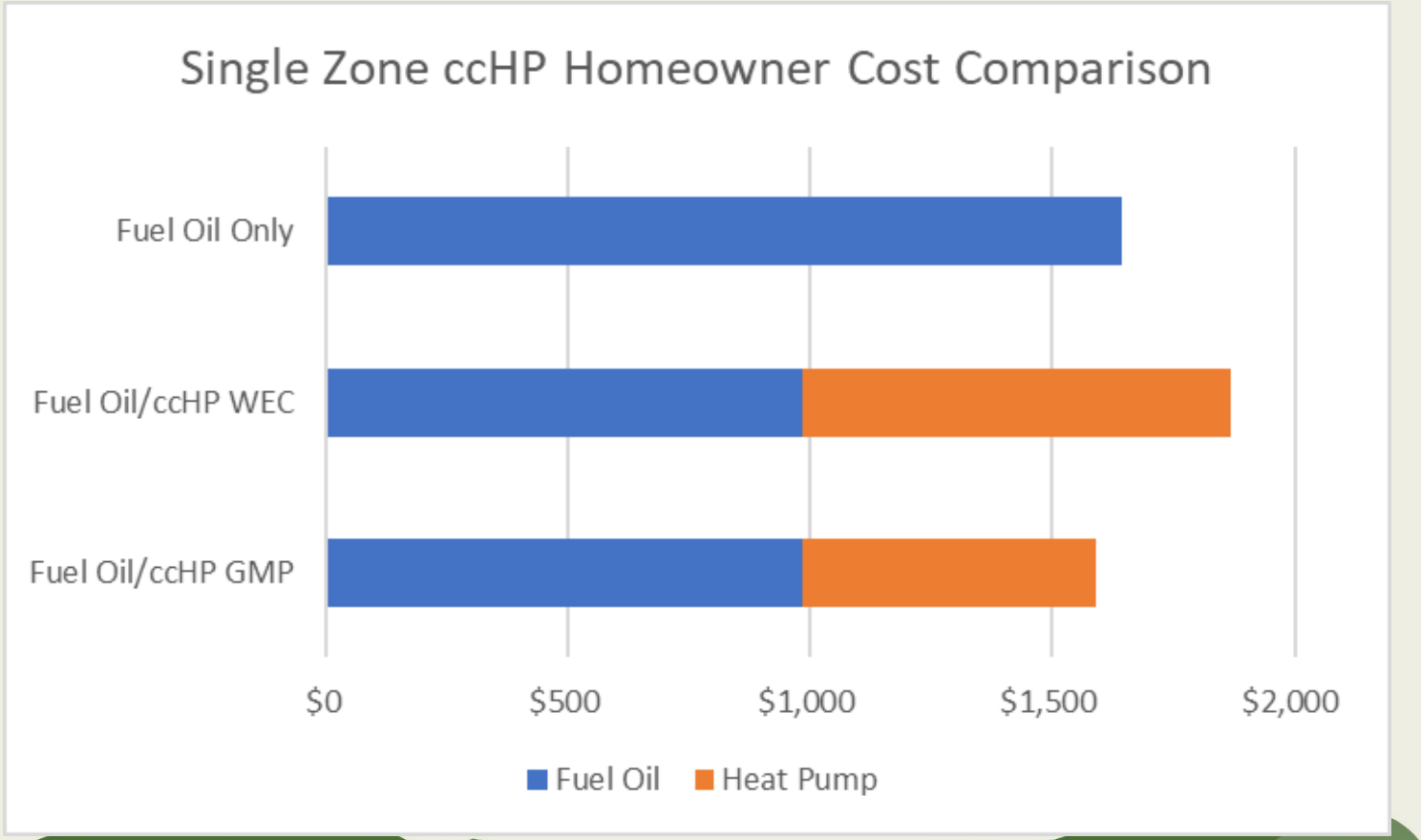
Electricity Price Matters

First Year Fuel Cost Comparison

- Single Zone ccHP.
- Assumes 40% of Heating Load Displaced;
- $2.74/gallon Fuel Oil;
- COP: 2.5 for ccHP, 0.85 for Fuel Oil Burner.

Variable Rates:

- GMP $0.16893
- WEC $0.25341



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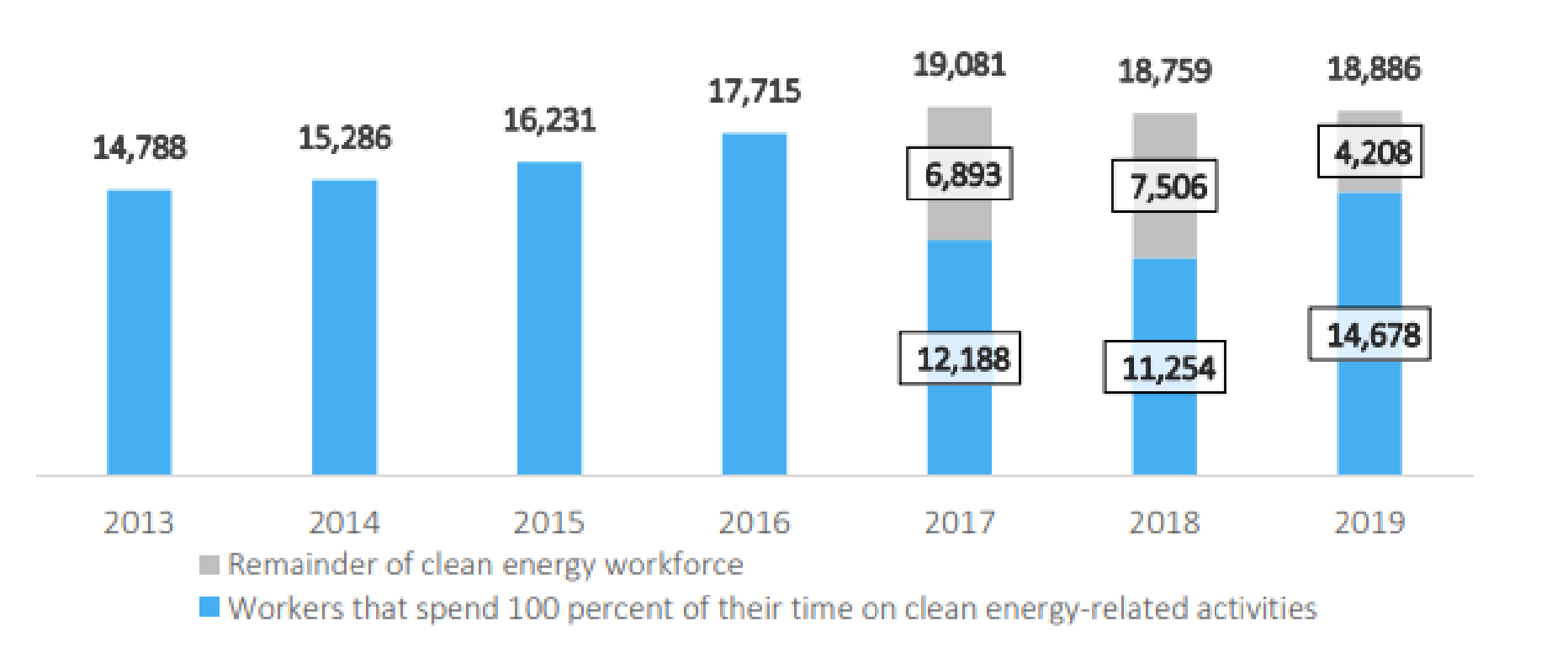
Clean Energy Jobs in Vermont



Source: 2019 Clean Energy Industry Report: https://publicservice.vermont.gov/sites/dps/files/documents/2019%20Vermont%20Clean%20Energy%20Industry%20Report.pdf.

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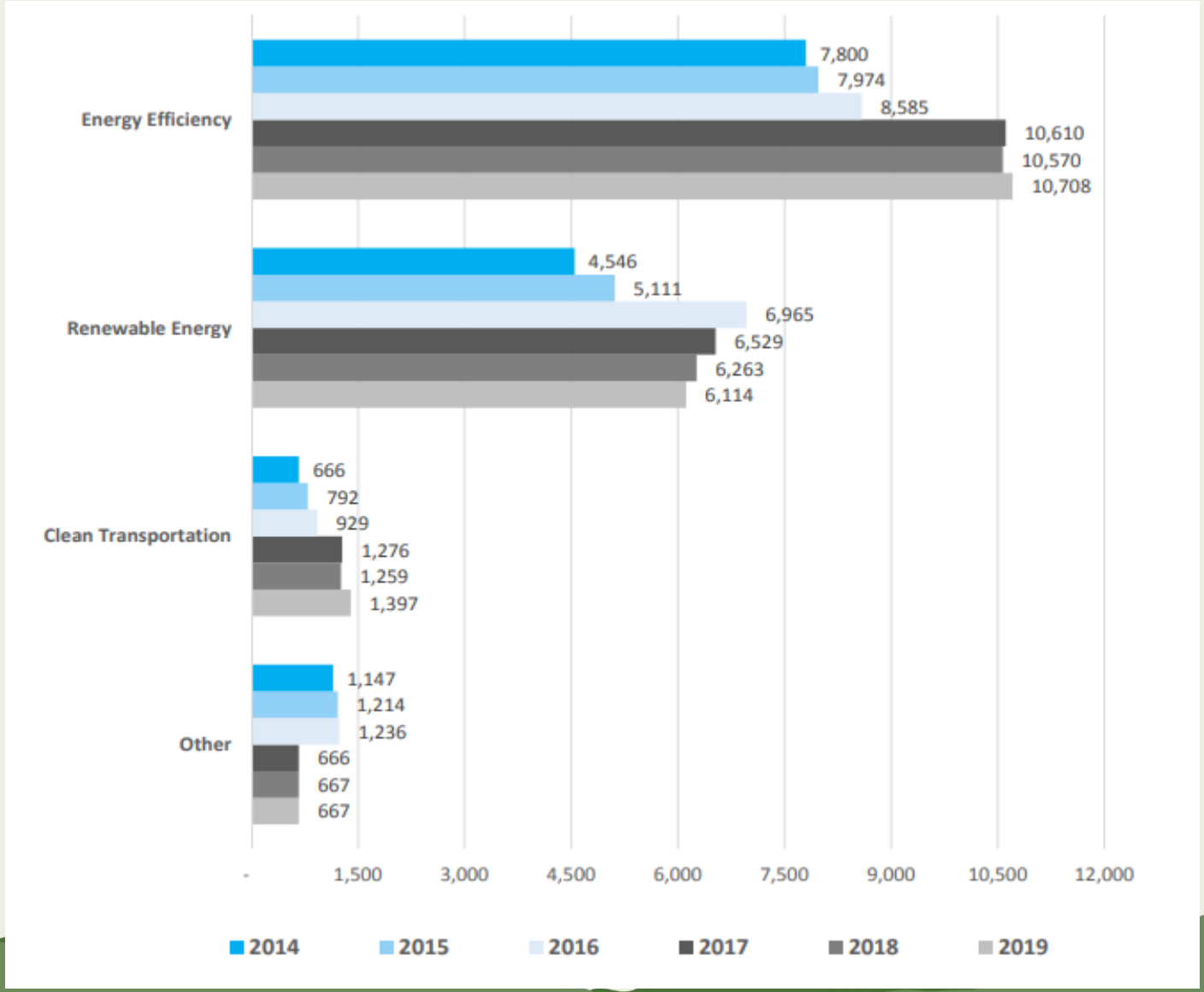
Clean Energy Jobs in VT by Sector

Source: 2019 Clean Energy Industry Report: https://publicservice.vermont.gov/sites/dps/files/documents/2019%20Vermont%20Clean%20Energy%20Industry%20Report.pdf.



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