

Press Release

5 November 2020

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## **Rooftop solar with battery can reduce emissions up to 10 times compared to coal**

A new report, by an International Energy Agency task force, finds that residential solar PV with battery storage can reduce emissions up to 10 times compared to grid electricity from coal.

Australia is participating in a research program with the International Energy Agency to assess the lifecycle of residential PV and battery systems to quantify their environmental impacts.

The analysis found the lifetime emissions for a 10kW rooftop system with a 10kWh battery, were 84 CO<sub>2</sub>-eq/kWh - nearly ten times less than the 820 CO<sub>2</sub>-eq/kWh emissions from burning coal, and five times less than the 490 CO<sub>2</sub>-eq/kWh emissions from natural gas.[1][2]

Around half of the impact for a residential PV and battery system comes from the PV panel production, while the battery production contributes around 25% of the total emissions. The choice of the PV panel technology was found to have a significant influence, with thin-film technology out-performing silicon in sustainability.

For batteries, their lifetime and storage capacity had a major influence on their environmental impact. Batteries with longer lifetimes showed better sustainability outcomes, while batteries with increased storage capacity showed negative outcomes, associated with the production of additional battery cells.

The report tested 10kWp rooftop PV systems with 10kWhr battery storage in Central Europe where annual yield is 1000 kWh/kWp. As the annual yield for PV systems is higher for most of Australia, it is expected that the emissions for an equivalent residential system would be even lower.

Different battery sizes, battery technologies and PV panel technologies were also considered.

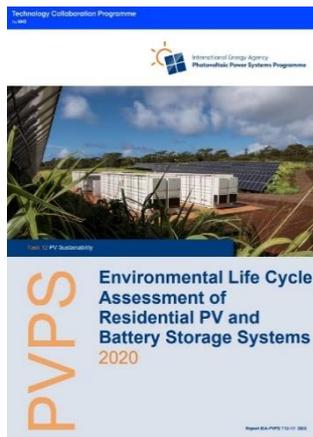
Additional findings showing the benefit of solar over gas came from a review of the delivery of grid electricity in California from 2016 to 2030. In this analysis, the use of utility-scale battery storage will be an order of magnitude better than the emissions and air quality impact of using natural gas generation.

[1] Schlömer S. et al. Annex III: Technology-specific cost and performance parameters. Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment

Report of the Intergovernmental Panel on Climate Change. Cambridge University Press; 2014.  
[2] RMIT ABC Fact Check 4/11/20 [Adam Bandt says gas is just as dirty as coal. Is he correct?](#)

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## [Full Report](#)



### **Environmental Life Cycle Assessment of Residential PV and Battery Storage Systems 2020**

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### **About the IEA PV Power Systems Programme:**

Australian Engineer Dr José Bilbao of UNSW has recently been promoted to the prestigious position of Operating Agent for the International Energy Agency Photovoltaic Power Systems Programme Task 12. This project aims to foster international collaboration and knowledge creation in photovoltaic (PV) environmental sustainability and safety. The Australian PV Institute, with support from ARENA, leads Australia's engagement in the IEA PV Power Systems program and works with its members to increase the uptake of PV through quality research, data and analysis.

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### **About the APVI**

The Australian PV Institute is a not-for-profit, member based organisation which focuses on data analysis, independent and balanced information, and collaborative research. Our objective is to *support the increased development and use of PV via research, analysis and information*. The APVI promotes solar through its live solar mapping platform [<http://pv-map.apvi.org.au>], the national solar research conference and Australia's participation in two International Energy Agency (IEA) programs – PVPS (Photovoltaic Power Systems) for solar photovoltaics and SHC (Solar Heating and Cooling), concerned with new solar thermal products and services.

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