

## Complete List of Publications

I have co-authored 29 peer-reviewed journal articles, 1 book chapter and 4 patents. My h-index is 17 and the total number of citations of my publications is 1171 according to Google Scholar (May 2021).

ORCID: <http://orcid.org/0000-0003-1665-1281>

Google Scholar: <https://scholar.google.es/citations?user=ZMH8qNYAAAAJ&hl=es>

Four selected publications are indicated by \* and a brief description is provided.

## PEER-REVIEWED PUBLICATIONS

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- \*J.29 **M. Victoria**, N. Haegel, I. M. Peters, R Sinton, A. Jäger-Waldau, C. Cañizo, C. Breyer, M. Stocks, A. Blakers, I. Kaizuka, K. Komoto, A. Smets, Solar photovoltaics is ready to power a sustainable future, *Joule* 5, 1-16 (2021), **Impact Factor 27.054** <https://10.1016/j.joule.2021.03.005>

Most Integrated Assessment Models (IAMs) have underestimated the role that solar PV can play in future low-carbon energy systems. This is critical as IAMs results constitute the main scenarios included in the Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC). In this review, we discuss the main reasons behind the underestimation of solar PV and compare IAMs results with those provided by energy models using high spatial and temporal resolution. We include a call for action for improving IAMs and changing the paradigm regarding the role that solar PV can play to mitigate climate change. We also identify the challenges for a sustained scaling up of solar PV in the next decade and provide recommendations. I was responsible for the conceptualization, visualization and writing of the original draft. I also **coordinated the international team of researchers** including experts from universities and knowledge institutions in the US, Europe, Japan, and Australia.

- J.28. T. T. Pedersen, **M. Victoria**, M. G. Rasmussen, G. B. Andresen, Modelling all alternative solutions for highly renewable energy systems, accepted for publication in *Energy*, preprint: <https://arxiv.org/abs/2010.00836>
- J.27. L. J. Schwenk-Nebbe, **M. Victoria**, G. B. Andresen, M. Greiner, CO<sub>2</sub> quota attribution effects on the European electricity system comprised of self-centred actors, *Advances in Applied Energy* 2, 100012 (2021) 5-year Impact Factor: 8.848 <https://doi.org/10.1016/j.adapen.2021.100012>
- J.26 C. Gallego-Castillo, M. Heleno, **M. Victoria**, Self-consumption for energy communities in Spain: a regional analysis under the new legal framework, *Energy Policy* 150, 112144 (2021) 5-year impact factor: 5.693 <https://doi.org/10.1016/j.enpol.2021.112144> Open Version: <https://arxiv.org/abs/2006.06459>
- J.25 C. Gallego-Castillo and **M. Victoria**, Improving energy transition analysis tool through hydropower statistical modelling, *Energies* 14, 98 (2021) 5-year Impact Factor: 2.822 <https://dx.doi.org/10.3390/en14010098>

- \*J.24 **M. Victoria**, K. Zhu, T. Brown, G. B. Andresen, M. Greiner, Early decarbonisation of the European energy system pays off, *Nature communications* 11, 6223 (2020) 5-year **Impact Factor: 13.610**  
<https://www.nature.com/articles/s41467-020-20015-4>

Transition paths are traditionally analysed using coarse models with annual resolution and neglecting transmission grids, while power system models with detailed network representation miss other sectors and the existence of a limited carbon budget. This approach unveils two significant results. First, our analysis shows that it is cost-effective to use solar photovoltaics and wind as the cornerstone of a future decarbonised European Energy system. This contradicts the traditional energy transition narrative that comprises mostly scenarios requiring a significant contribution from biomass and/or nuclear. In this work, we combine the two approaches and investigate transition paths in Europe using a model that: (i) includes uninterrupted hourly resolution and network representation, (ii) couples the power system with the heating and transport sectors and (iii) uses myopic optimization for a given carbon budget. Second, the myopic modelling approach implemented here for the first time enables us to identify that following an early and steady path in which emissions are strongly reduced in the first decade is more cost-effective than following a late and rapid path in which low initial reduction targets quickly deplete the carbon budget and require a sharp #reduction later.

- J.23 K. Zhu, **M. Victoria**, T. Brown, G. B. Andresen, M. Greiner, Impact of climatic, technical and economic uncertainties on the optimal design of a coupled fossil-free electricity, heating and cooling system in Europe, *Applied Energy* 262, 114500 (2020). <https://doi.org/10.1016/j.apenergy.2020.114500> 5-Year **Impact Factor: 8.558** Open version: <https://arxiv.org/abs/1910.03283>

- J22. **M. Victoria**, K. Zhu, T. Brown, G. B. Andresen, M. Greiner, The role of photovoltaics in a sustainable European energy system under variable CO<sub>2</sub> emissions targets, transmission capacities, and costs assumptions, *Progress in Photovoltaics* 28, 483–492 (2020) 5-Year **Impact Factor: 7.776**  
<https://doi.org/10.1002/pip.3198> Open version: <https://arxiv.org/abs/1911.06629>

- \*J21. **M. Victoria**, K. Zhu, T. Brown, G. B. Andresen, M. Greiner, The role of storage technologies throughout the decarbonisation of the sector-coupled European energy system, *Energy Conversion and Management* 201 (1) 111977, (2019) <https://doi.org/10.1016/j.enconman.2019.111977> **Journal Impact Factor: 8.208** Open version: <https://arxiv.org/abs/1906.06936>

The analysis included in this paper overcomes the previous common understanding (“storage is needed in highly renewable energy systems”) by showing the emergence of two different kind of storage technologies and the requirement to combine both to ensure feasible operation of the system. The two storage technologies show fundamentally different characteristics (energy and power capacities) and operation patterns, ensuring the balancing of renewable fluctuations at different timescales.

- J20. K. Zhu, **M. Victoria**, T. Brown, G. B. Andresen, M. Greiner, Impact of CO<sub>2</sub> prices on a highly decarbonised coupled electricity and heating system in Europe, *Applied Energy* 236, 622-634 (2019).  
<https://doi.org/10.1016/j.apenergy.2018.12.016> **Impact Factor: 8.558** Open version: <https://arxiv.org/abs/1809.10369>

- \*J19. **M. Victoria**, G. B. Andresen, Using validated reanalysis data to investigate the impact of the PV system configurations at high penetration levels in European countries, *Progress in Photovoltaics* (27), 576-592 (2019) (Selected for the Issue cover) <https://doi.org/10.1002/pip.3126> **Impact factor: 7.776**  
 Open version: <https://arxiv.org/abs/1807.10044>

Here, we proposed a method to convert irradiance data from reanalysis into solar generation time series and validated them using historical data. The model was used to produce long-term time series for 30 European countries that are used by myself and others as input for energy models. The time series were released under an open license [10.5281/zenodo.2613651](https://doi.org/10.5281/zenodo.2613651). The article was **selected for the cover** of the July 2019 issue of *Progress in Photovoltaics* which is the main journal in the field of solar photovoltaics.  
<https://onlinelibrary.wiley.com/toc/1099159x/2019/27/7>

- J18. **M. Victoria**, C. Gallego-Castillo, Hourly-resolution analysis of electricity decarbonization in Spain 2017-2030, *Applied Energy* 233, 674-690 (2019) **Impact Factor: 8.558**  
<https://doi.org/10.1016/j.apenergy.2018.10.055>

- J17. R. Nuñez, **M. Victoria**, S. Askins, I. Antón, C. Domínguez, R. Herrero, G. Sala, Spectral impact on multi-junction solar cells obtained by means of component cells of a different technology, *IEEE Journal of Photovoltaics* **8**, 646-653, <https://doi.org/10.1109/JPHOTOV.2017.2782561> Impact Factor: 3.398
- J16. G. Vallerotto, **M. Victoria**, S. Askins, I. Antón, G. Sala, R. Herrero, C. Domínguez, Indoor Experimental Assessment of the Efficiency and Irradiance Spot of the Achromatic Doublet on Glass (ADG) Fresnel Lens for Concentrating Photovoltaics, *J. Vis. Exp.* (128), 2017, <https://doi.org/10.3791/56269> Journal Impact factor: 1.351
- J15. R. Herrero, I. Antón, **M. Victoria**, C. Domínguez, S. Askins, G. Sala, D. De Nardis, K. Araki, Experimental analysis and simulation of a production line for CPV modules: Impact of defects, misalignments, and binning of receivers. *Energy Science & Engineering* **5**, 257-269 (2017) <https://doi.org/10.1002/ese3.178> Journal Impact factor: 2.893
- J14. **M. Victoria**, S. Askins, R. Herrero, I. Antón, and G. Sala, "Assessment of the optical efficiency of a primary lens to be used in a CPV system," *Solar Energy* **134**, 406-415 (2016). <https://doi.org/10.1016/j.solener.2016.05.016> 5-Year Impact Factor: 4.807
- J13. R. Núñez, J. Chen, **M. Victoria**, C. Domínguez, S. Askins, R. Herrero, I. Antón, and G. Sala, "Spectral study and classification of worldwide locations considering several multijunction solar cell technologies," *Prog. Photovolt. Res. Appl.* **24**, 1214-1228 (2016). <https://doi.org/10.1002/pip.2781> 5-Year Impact Factor: 7.776
- J12. R. Núñez, C. Domínguez, S. Askins, **M. Victoria**, R. Herrero, I. Antón, and G. Sala, "Determination of spectral variations by means of component cells useful for CPV rating and design," *Prog. Photovolt. Res. Appl.* **24**, 663-679 (2016). <https://doi.org/10.1002/pip.2715> 5-Year Impact Factor: 7.776
- J11. G. Vallerotto, **M. Victoria**, S. Askins, R. Herrero, C. Domínguez, I. Antón, and G. Sala, "Design and modeling of a cost-effective achromatic Fresnel lens for concentrating photovoltaics," *Opt. Express* **24**, A1245-A1256 (2016). <https://doi.org/10.1364/OE.24.0A1245> Journal Impact Factor: 3.561
- J10. C. J. Gallego-Castillo and **M. Victoria**, "Cost-free feed-in tariffs for renewable energy deployment in Spain," *Renew. Energy* **81**, 411-420 (2015). <https://doi.org/10.1016/j.renene.2015.03.052> 5-Year Impact Factor: 5.257
- J9. **M. Victoria**, C. Domínguez, S. Askins, I. Antón, and G. Sala, "Experimental analysis of a photovoltaic concentrator based on a single reflective stage immersed in an optical fluid," *Prog. Photovolt. Res. Appl.* **22**, 1213-1225 (2014). <https://doi.org/10.1002/pip.2381> 5-Year Impact Factor: 7.776
- J8. J. Cubas, S. Pindado, and **M. Victoria**, "On the analytical approach for modeling photovoltaic systems behavior," *J. Power Sources* **247**, 467-474 (2014). <https://doi.org/10.1016/j.jpowsour.2013.09.008> 5-Year Impact Factor: 6.823
- J7. **M. Victoria**, R. Herrero, C. Domínguez, I. Antón, S. Askins, and G. Sala, "Characterization of the spatial distribution of irradiance and spectrum in concentrating photovoltaic systems and their effect on multi-junction solar cells," *Prog. Photovolt. Res. Appl.* **21**, 308-318 (2013). <https://doi.org/10.1002/pip.1183> 5-Year Impact Factor: 7.776
- J6. **M. Victoria**, S. Askins, C. Domínguez, I. Antón, and G. Sala, "Durability of dielectric fluids for concentrating photovoltaic systems," *Sol. Energy Mater. Sol. Cells* **113**, 31-36 (2013). <https://doi.org/10.1016/j.solmat.2013.01.039> 5-Year Impact Factor: 5.105
- J5. **M. Victoria**, C. Domínguez, I. Antón, and G. Sala, "Antireflective coatings for multijunction solar cells under wide-angle ray bundles," *Opt. Express* **20**, 8136 (2012). <https://doi.org/10.1364/OE.20.008136> Journal Impact Factor: 3.561

- J4. R. Herrero, **M. Victoria**, C. Domínguez, S. Askins, I. Antón, and G. Sala, "Concentration photovoltaic optical system irradiance distribution measurements and its effect on multi-junction solar cells," Prog. Photovolt. Res. Appl. **20**, 423–430 (2012). <https://doi.org/10.1002/pip.1145> 5-Year Impact Factor: 7.776
- J3. **M. Victoria**, C. Domínguez, S. Askins, I. Antón, and G. Sala, "Characterizing FluidReflex Optical Transfer Function," Jpn. J. Appl. Phys. **51**, 10ND06 (2012) <http://dx.doi.org/10.1143/JJAP.51.10ND06> Journal Impact factor: 1.471
- J2. I. Antón, C. Domínguez, **M. Victoria**, R. Herrero, S. Askins, and G. Sala, "Characterization Capabilities of Solar Simulators for Concentrator Photovoltaic Modules," Jpn. J. Appl. Phys. **51**, 10ND12 (2012). <http://dx.doi.org/10.1143/JJAP.51.10ND12> Journal Impact factor: 1.471
- J1. **M. Victoria**, C. Domínguez, I. Antón, and G. Sala, "Comparative analysis of different secondary optical elements for aspheric primary lenses," Opt Express **17**, 6487–6492 (2009). Journal Impact Factor in 2009: 4.49 <https://doi.org/10.1364/OE.17.006487>

## BOOKS AND BOOK CHAPTERS

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- B1. I. García, **M. Victoria**, and I. Antón, Chapter V: Temperature Effects and Thermal Management. Handbook of Concentrator Photovoltaic Technology (John Wiley and Sons, Ltd, 2016).
- M. Victoria** and R. Herrero, Colección de problemas de concentración fotovoltaica, Fundación Rogelio Segovia para el Desarrollo de las Telecomunicaciones., 2015 (ISBN: 9788474024128)

## PATENTS

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- PAT4. PCT/ES2018/070303, WO2019197689, S. Askins, J. Caselles, **M. Victoria**, I. Antón, Tracking Device, 2020. The patented technology is currently being exploited by the company Solar Rays Energy [www.solaraysenergy.com](http://www.solaraysenergy.com)
- PAT3. PCT WO 2015/101626A1, I. Antón, G. Sala, S. Askins, **M. Victoria**, Lens having limited chromatic aberration for photovoltaic concentrators and method for manufacturing said lens, 2015.
- PAT2. EP 2984497 B1, PCT WO2014/167086A1, Method and device suitable for characterizing photovoltaic concentration modules, R. Herrero, I. Antón, G. Sala, **M. Victoria**, S. Askins, 2014.
- PAT1. EP 3005422 B1, PCT WO 2014/181975A1, Solar cell receiver suitable for reflective solar concentrator modules, I. Antón, G. Sala; C. Domínguez, S. Askins, **M. Victoria**, 2014.