

## Dr. Hannah E. Daly

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**Publications:** <http://tiny.cc/21kwez>

Dr. Hannah Daly is a Lecturer (above the merit bar) in Sustainable Energy Systems at University College Cork. Her research and lecturing focus on modelling and developing sustainable pathways for the energy system, encompassing energy access, climate change and air pollution, and she engages extensively with policymakers, civil society and academia on those topics. As well as being a lead contributing author to several International Energy Agency World Energy Outlook reports, she has co-authored over 20 peer-reviewed articles and several book chapters and other reports.

## Education

2009 – 2012	University College Cork	Doctor of Philosophy (PhD), “Transport energy demand: techno-economic modelling and scenarios for Irish climate policy”. Supervisor Prof. Brian O’Gallachoir.
2004 – 2009	University College Cork	BSc (Hons) Mathematical Sciences
2007 – 2008	University of California, Santa Cruz	University of California Visiting Scholarship

## Professional Appointments

2019 – present	University College Cork	Lecturer in Sustainable Energy Systems (above the merit bar)
2015 – 2019	International Energy Agency, Paris	Agency lead on Energy Access and SDG7 collaboration; analyst for World Energy Outlook
2012 – 2015	UCL Energy Institute, London	Research Associate in Energy Systems Modelling. Lead developer of UK-TIMES Model

### Periods of maternity leave:

November 2015 – April 2016

August 2018 – July 2019

## Teaching and supervision experience

### PhD Supervision

Primary supervisor (2014-15), Xuebing Wang, UCL. *The Impacts to the International Aviation Industry by including it to the EU-ETS*. Graduated 2019.

Primary supervisor, Jason McGuire, UCC. *Modelling residential sector innovations in energy systems models*. 2019-2023 (expected)

Secondary supervisor, Vera O’Riordan, UCC. *Passenger transport energy demand in the context of Ireland’s Climate Action Plan*. 2019 – 2023 (expected)

Primary supervisor, Ankita Gaur, UCC. *Modelling sustainable energy transitions for Ireland: Capturing technological, economic and social realities*. 2020 – 2024 (expected)

### Masters research supervision

Primary supervisor to MEngSc and MSc research dissertations of five students to completion at UCL and UCC. Currently primary supervisor to two MEngSc research dissertations.

### Undergraduate and postgraduate lecturing

NE1001 (Introduction to Energy Engineering, UCC), module coordinator (since 2019)

NE3003 (Sustainable Energy, UCC), module coordinator (since 2019)

NE4001 (Energy Systems Modelling, UCC), module coordinator (since 2019)

BEGC15 (Modelling Methods and Scenarios, University College London), lecturer, 2014-2015

Extensive number of presentations and public engagement with different audiences, including policymakers, industry experts, and the general public.

## Projects & Funding

1. MaREI, SFI Funded Investigator PhD award, €140k (2020 – 2024)
2. Advisor on Irish TIMES development, “Climate Action Modelling Group” project funded by Department of Climate Action, Communications and Environment, 2019-2023.
3. At IEA, lead proposal for multi-million euro grant related to energy access and sustainable development from the European Commission.
4. Horizon 2020 Grant No 691739 – “Role of technologies in an energy efficient economy – model based analysis policy measures and transformation pathways to a sustainable energy system”, total EU contribution €4 million. Project coordinator: Mark Howells, KTH Royal Institute of Technology. I wrote the UCL contribution to WP3 on the role of behaviour in mitigation pathways, which forms a substantial basis for the current work of the consortium.
5. Convened International BE4 Workshop on Behaviour within Energy/Engineering/Economics/Environmental Models, April 2015. Awarded €24k funding from IEA-ETSAP and WholeSEM.
6. Awarded €7k funding from IEA-ETSAP for collaboration between UCC, UC Davis (USA) and E4sma (Italy): Introducing modal shifting in TIMES, January – June 2012 (lead author).
7. Irish Research Council for Science, Engineering and Technology EMBARK PhD scholarship, 2009 – 2012, €72k.

## **Publications** (see [Google Scholar](#) for up-to-date list)

### **Peer-reviewed articles appearing in international journals**

1. Jewell J., ... **Daly H.**, ..., van Vuuren D. (2020) Reply to: Why fossil fuel producer subsidies matter. *Nature*. doi: 10.1038/s41586-019-1921-9
2. DeCarolis J, **Daly H.**, Dodds P, Keppo I, Li F, McDowall W, Pye S, Strachan N, Trutnevyte E, Usher W, Winning M, Yeh S, Zeyringer M. (2017) Formalizing best practice for energy system optimization modelling. *Applied Energy*, 194 184-198
3. OY Edelenbosch, DP van Vuuren, C Bertram, S Carrara, J Emmerling, **H Daly**, A Kitous, DL McCollum, N Saadi Failali (2017) Transport fuel demand responses to fuel price and income projections: Comparison of integrated assessment models. *Transportation Research Part D: Transport and Environment*. 55, 310-321.
4. Edelenbosch, O. Y., McCollum, D. L., van Vuuren, D. P., Bertram, C., Carrara, S., **Daly, HE**, ... & Karkatsoulis, P. (2017). Decomposing passenger transport futures: Comparing results of global integrated assessment models. *Transportation Research Part D: Transport and Environment*.
5. Strachan N, Fais B, **Daly HE** (2016) Reinventing the energy modelling–policy interface. *Nature Energy*. Feb 29;1:16012.
6. Fais B, Keppo I, Zeyringer M, Usher W, **Daly HE**. (2016) Impact of technology uncertainty on future low-carbon pathways in the UK. *Energy Strategy Reviews*. 230;13:154-68.
7. Scott, K., **Daly, HE**, Barrett, J., & Strachan, N. (2016). National climate policy implications of mitigating embodied energy system emissions. *Climatic Change*, 136(2), 325-338.
8. Pye, S., & **Daly, HE** (2015). Modelling sustainable urban travel in a whole systems energy model. *Applied Energy*, 159, 97-107.
9. **Daly HE**, Scott K, Barrett J, Strachan N (2015) Indirect CO2 emission implications of energy system pathways: Linking IO and TIMES models for the UK. *Environmental Science and Technology*. 49 (17), 10701-10709
10. Lott, M., & **Daly, H.** (2015). The Impacts of Transport Sector Decarbonisation Pathways on Air Quality and Public Health in the United Kingdom. *Journal of Transport & Health*, 2(2), S37.
11. **Daly HE**, Ramea K, Chiodi A, Yeh S, Gargiulo M, Ó Gallachóir B (2014) Incorporating travel behaviour and travel time into TIMES energy system models. *Applied Energy* 135 (0):429-439. doi:http://dx.doi.org/10.1016/j.apenergy.2014.08.051
12. Whyte K, **Daly HE**, Ó Gallachóir BP (2013) Modelling HGV freight transport energy demand in Ireland and the impacts of the property construction bubble. *Energy* 50 (0):245-251. doi:http://dx.doi.org/10.1016/j.energy.2012.12.030
13. Leinert S, **Daly HE**, Hyde B, Gallachóir BÓ (2013) Co-benefits? Not always: Quantifying the negative effect of a CO2-reducing car taxation policy on NOx emissions. *Energy Policy* 63 (0):1151-1159. doi:http://dx.doi.org/10.1016/j.enpol.2013.09.063
14. Rogan F, Cahill C, **Daly HE**, Dineen D, Deane JP, Heaps C, Welsch M, Howells M, Bazilian M, Ó Gallachóir B (2013) LEAPs and Bounds—an Energy Demand and Constraint Optimised Model of the Irish Energy System. *Energy Efficiency*:1-26. doi:10.1007/s12053-013-9231-9
15. **Daly HE**, Ó Gallachóir BP (2012) Future energy and emissions policy scenarios in Ireland for private car transport. *Energy Policy* 51 (0):172-183. doi:http://dx.doi.org/10.1016/j.enpol.2012.08.066
16. **Daly HE**, Ó Gallachóir BP (2011) Modelling private car energy demand using a technological car stock model. *Transportation Research Part D: Transport and Environment* 16 (2):93-101

17. **Daly HE**, Ó Gallachóir BP (2011) Modelling future private car energy demand in Ireland. *Energy Policy* 39 (12):7815-7824. doi:<http://dx.doi.org/10.1016/j.enpol.2011.09.027>
18. Rogan F, Dennehy E, **Daly HE**, Howley M, Ó Gallachóir BP (2011) Impacts of an emission based private car taxation policy – First year ex-post analysis. *Transportation Research Part A: Policy and Practice* 45 (7):583-597. doi:<http://dx.doi.org/10.1016/j.tra.2011.03.007>

### **Selected peer-reviewed conference papers and unpublished papers**

19. Stephen J Lee, Eduardo Sánchez Jacob, Andrés González García, Pedro Ciller Cutillas, Pablo Dueñas Martínez, Jay Taneja, Fernando Cuadra García, Julio Lumbreras Martín, **Hannah Daly**, Robert J Stoner, José Ignacio Pérez Arriaga (2019) Investigating the necessity of demand characterization and stimulation for geospatial electrification planning in developing countries. Comillas repository <http://hdl.handle.net/11531/42497>
20. **Daly HE**, Scott K, Barrett J, Strachan N (2014) Counting Consumption-Based Energy System Emissions: Linking an Energy System and EEIO Model. Paper presented at the 37th IAEE International Conference, New York, USA, June 2014
21. Wang X, **Daly, HE** (2014) The economic impact on GDP growth in selected areas of building a global emissions trading scheme. Paper presented at the 4th International Association of Energy Economics Asian Conference, Beijing, China, 19–21 September 2014.
22. **Daly HE**, Scott K, Barrett J, Strachan N (2013) Does accounting for indirect emissions affect energy system decarbonisation pathways? Paper presented at the 13th European IAEE Conference, Dusseldorf, Germany, August 2013
23. Wang X, **Daly, HE** (2013) A comparison of the impacts of environmental taxation and emissions trading on Chinese Airlines. Paper presented in 14th Global Conference on Environmental Taxation, Kyoto, Japan. 17–19 October, 2013.
24. **Daly HE**, Ramea K, Chiodi A, Yeh S, Gargiulo M, Ó Gallachóir BP (2012) Modelling Transport Modal Choice and Its Impacts on Climate Mitigation. Paper presented at the 31st International Energy Workshop, Cape Town, South Africa, June 19th-21st, 2012
25. **Daly HE**, Ó Gallachóir B.P., 2011. Two technological approaches for long-term private car energy policy modelling in Ireland. in Irish Transport Research Network, August 31st – September 1st. University College Cork, Ireland. Best paper in session award.
26. **Daly HE**, Ó Gallachóir B (2010) Private Car Transport and the 10% RES-T Target - Quantifying the Contribution of EVs and Biofuels. In: Irish Transport Research Network, 2010, University College Dublin, Ireland, 31st August to 1st September 2010 .
27. **Daly HE**, Ó Gallachóir B (2010) Evaluating the Impact of Energy Efficiency and CO2 Emissions Measures on Private Car Transport Using a Stock Model. Paper presented at the International Energy Program Evaluation Conference, Paris, France, June 9th - 10th 2010.
28. **Daly HE**, Ó Gallachóir, B.P., (2010). Forecasting Private Car Energy Demand Using Bottom-Up Car Stock Modelling. in Young Energy Economy Engineer Seminar. November 26th – 27th 2010, Dublin, Ireland
29. Foley A.M., **Daly, H.E.**, McKeogh E.J., Ó.Gallachoir, B.P, (2010) Quantifying the energy & carbon emission implications of a 10% electric vehicle target, International Energy Workshop, June 21st – 23rd, Stockholm, Sweden

### **Book chapters**

1. **Daly HE**, Dodds P, McDowall W (2015) The Demand Side: Challenges and options for sustainable travel: Mobility, motorisation and vehicle technologies. In Ekins P, ed. *Global Energy: Issues, Potentials and Policy Implications*. Oxford University Press.

2. **Daly HE**, Ramea K, Chiodi A, Yeh S, Gargiulo M, Ó Gallachóir BP (2015) Transport behaviour in TIMES: Modelling mode shift and travel time budgets for Ireland and California. In Labriet M. ed. Informing energy and climate policies using energy systems models. Springer.

## Reports

1. (Contributing author) Long Term Strategy – A Net Zero Energy System for Ireland in 2050, 2019. Submitted to DCCAE November 15<sup>th</sup> 2019.
2. (Lead author) IEA, IRENA, UNSD, World Bank, WHO, 2018. Tracking SDG7: The Energy Progress Report.
3. (Lead author) IEA, UNDP, IRENA. Policy Brief 1: Achieving Universal Access to Electricity, ADVANCING SDG7 IMPLEMENTATION IN SUPPORT OF THE 2030 AGENDA. Policy Briefs in Support of the first SDG7 Review at the UN High-Level Political Forum 2018. UNDESA, 2018.
4. (Lead author) IEA, 2017. Energy Access Outlook 2017: from Poverty to Prosperity. World Energy Outlook 2017 special report. OECD/IEA, Paris
5. (Lead author) IEA and World Bank, 2017. Global Tracking Framework 2017: Progress Towards Sustainable Energy for All. World Bank, April 2017.
6. (Principal author) World Energy Outlook, 2017. OECD/IEA, Paris.
7. (Principal author) World Energy Outlook, 2016. OECD/IEA, Paris.
8. (Principal author) Mexico Energy Outlook – World Energy Outlook Special Report, 2016. OECD/IEA, Paris.
9. (Principal author) Energy and Air Pollution – World Energy Outlook Special Report, 2016. OECD/IEA, Paris.
10. (Contributing author) Energy and Climate Change - World Energy Outlook Special Briefing for COP 21.
11. Jewell, J., McCollum, D., Krey, V., Riahi, K., Berger, L., Bertram, C., **Daly, H.**, Fais, B., Gernaat, D., Emmerling, J., Paroussos, L., Saveyn, B., van Vuuren, D. (2016) Improving the representation of existing energy policies (taxes and subsidies) in IAMs. FP7-Cooperation-ENV Collaborative Project No 308329
12. **Daly HE**, Doddle PE, Fais B (2014) The UK TIMES Documentation v1.0. UCL Energy Institute.
13. **Daly HE** (2012) Transport energy demand: Techno-economic modelling and scenarios for Irish climate policy. PhD thesis, University College Cork. Available from <https://cora.ucc.ie/bitstream/handle/10468/1552/Thesis-HD-final-01022013.pdf?sequence=1>
14. **Daly HE**, Ó Gallachóir, B.P., Chiodi, A., (2012) Meeting Ireland's Greenhouse Gas Targets – Options for Private Cars. Report to National Economic & Social Council Secretariat.
15. **Daly HE**, Ramea K, Chiodi A, Yeh S, Gargiulo M, Ó Gallachóir BP (2012) Modal choice in a TIMES model. Report submitted to IEA-ETSAP, May 2012
16. Patrick, G., Dineen, D., **Daly, H.**, & Ó Gallachóir, B. P. (2012). Improved Modelling of Aviation Energy Use and CO2 Emissions. Working Paper.
17. **Daly, H.**, Dineen, D., Rogan, F., Cahill, C. (2010) Bottom-Up Energy Demand Modelling - LEAP Ireland. In Energy Forecasts for Ireland to 2020, 2010 Report, Sustainable Energy Authority of Ireland, Dublin

## Conference presentations and keynotes (since 2013)

1. Keynote address, Renewable Energy Microgrids for sustainable Development Symposium, Northwestern University, April 2018.
2. High-level speaker, panellist and side event organiser, Global SDG7 Conference, United Nations Economic Commission for Asia and the Pacific, February 2018.

3. Invited address, Energy Modelling Platform for Africa (EMP-A) 2018 meeting, United Nations Economic Commission for Africa, January 2018.
4. Keynote address, UNESCAP Regional Preparatory Meeting on SDG7 for Asia-Pacific Forum on Sustainable Development. December 2017.
5. Keynote address, RES4MED&Africa Advanced Training Course, November 2017 - "Deployment of renewable energy solutions: challenges and opportunities"
6. Plenary lecture, 9th Annual Meeting of the LCS-RNet in Warwick, UK, September 2017
7. Panelist and panel chair, Sustainable Energy For All Forum, New York, April 2017
8. Invited speaker - Addressing the behavioural gap in energy/economy models: Outcomes of the BE4 Workshop and outlook for the state-of-the-art. In Our Common Future Under Climate Change Conference, Paris, 7th July 2015.
9. Invited speaker - How we treat behaviour in energy system optimisation models, in International BE4 Workshop, London, April 20th 2015.
10. Invited speaker - Incorporating indirect emissions into a bottom-up partial equilibrium UK TIMES energy system model, in EMInn Workshop: Accounting for life-cycle emissions in analysis of future energy systems, London, November 13th 2014.
11. Invited speaker - Low carbon scenario critical issues: Technology pathways for a low-carbon energy transition - critical insights from the energy system model UKTM In WholeSEM Annual Conference 2014 - Modelling Long-term UK Energy Futures: Challenges and Competing Objectives. July 8th 2014, London, UK.
12. Invited speaker - TIMES Energy Systems Models, in WholeSEM/DECC stakeholder workshop, Whitehall, London, UK, March 6th 2014
13. Invited speaker - Transport energy modeling. In Modelling on the Move 6: Cycling & Transport Modelling, Westminster University, UK, January 22nd 2014
14. Invited speaker - Transport infrastructure and travel demand in energy system models, in Enhancing the state of transport modelling in IAMS, Expert Workshop. IIASA Austria, November 19th 2013.
15. Invited speaker - Modelling indirect emissions within UK TIMES, in 63rd Semi-annual ETSAP meeting, International Energy Agency, Paris, June 18th 2013.