

Date of Birth 28 August 1956

Civil status Married, two children

Education 2006 PhD in Development Studies, Roskilde University
1985 MSc in Engineering, Technical University of Denmark

Employment

2001- 2019 **UNEP DTU Partnership** (UDP), Technical University of Denmark
Chief Scientific Advisor (2018 - today)
Senior Researcher (2009 - 2018)
Researcher (2006 - 2009)
PhD fellow (2001 - 2005)



1990-2001 **Danish Energy Agency**

1999-2000: Project manager for a Danida supported twinning project providing technical and institutional support to the Energy Agency in Burkina Faso

1998-1999: Programme officer responsible for planning and administration of renewable energy programmes in DANCED and DANCEE

1990 -1997: Programme officer responsible for planning, administration and evaluation of the demonstration program for renewable energy with main focus on biomass technologies

1986-1990 **Carl Bro A/S (now SWECO)**

Consultant, Implementation and evaluation of renewable energy projects

1985 **Technical University of Denmark**

Research Assistant on research project developing an energy efficient stove

Research profile

Nygaard's research focuses on political, institutional and economic drivers of innovation, development and diffusion of climate friendly technologies in developing countries. Within an overall innovation system framework his research draws on three main theoretical perspectives: The sustainability transition perspective, the global value chain perspective (GVC) and the planned intervention perspective.

His research is based on insights from both social science, economic and engineering disciplines and uses quantitative as well as qualitative methods. Thematically, the research focusses on renewable energy technologies, including solar, wind, biomass and biofuel technologies, and comprises both small-scale technologies for rural electrification and large-scale technologies for national electricity grids.

Editorial experience

Associate Editor of Wiley Interdisciplinary Reviews (WIRE); Energy and Environment (2010-)

Co-editor of Special Issue of the journal Energy Research and Social Science entitled 'Uptake and diffusion of solar power in Africa' (2017-2018)

Co-editor of Special Issue of the journal, Environmental Science and Policy entitled 'Sustainability transitions in developing countries' (2015-2017)

Editor of Special collection of WIRE's Energy and Environment entitled 'Development and diffusion of PV in developing countries with special focus on Africa' (2016-2018)

Co-editor of Technology Transfer Perspectives, UNEP Risø Centre, Denmark (2011)

Memberships of scientific committees

Scientific reviewer for the Finnish Academy Programme for Development Research (2018), SIDA and Swedish Research Council (2016 & 2017), Norwegian Research Council, (2014), the Netherlands Organisation for Scientific Research (NWO) (2013)

Chairman of PhD Assessment committee, UNEP DTU Partnership: Sandra Bry Husum, (2014), Rico Kongsager, (2015), Maryna Henrysson (Karavai) (2017), Zyaad Boodoo (2018).

Member of PhD assessment committee at Norwegian University of Life Science (2013)

Member of the Danish national external examiners corps for Geography (Courses, projects and theses at Bachelor and Master's levels), (2014-2018)

Chairman of scientific assessment committee for two senior researchers at UDP (2015)

Board member of IDA Global Development (2018 -)

International research collaboration

Dr. Nygaard has since 2012 collaborated with researchers at a number of universities in the global south, such as University of Antananarivo, Madagascar; Strathmore University and University of Nairobi, Kenya; University of Stellenbosch, University of Cape Town, South Africa; Kwame Nkrumah University of Science and Technology (KNUST), Ghana; National Engineering College (ENI/ABT), Mali; Université Cheikh Anta Diop, Senegal; Faculté des Sciences et Techniques de Nouakchott, Mauritania; École Hassania des Travaux Publics, Morocco.

Further research collaboration within innovation systems, technology transfer and sustainability transitions is established with university researchers in the global norths, such as University of Delaware, Imperial College London, University of Surrey, SPRU at University of Sussex, TUE Eindhoven, VU University Amsterdam, Wageningen University, Delft University of Technology, Lund University, Norwegian University of Life Science, Aalborg University, Roskilde University and University of Copenhagen.

International research collaboration is further established through membership of international researcher networks, such as the Sustainability Transitions Research Network (STRN)

PhD supervision – completed

Mathilde Brix Pedersen (2017). Rural electrification through private sector business models: A study of solar powered mini-grids niche in Kenya, UDP (main supervisor)

Caroline Schaer (2015). Governance and community responses to floods in poor peri-urban areas: The case of urban disaster risk reduction and climate change adaptation in Pikine, Senegal. UDP (main supervisor)

Ulrich Elmer Hansen (2013). Development of biomass power plant technologies in Malaysia: niche development and the formation of innovative capabilities, UDP (main supervisor).

Tsiry Andriantahina (2018). Improving the performance of the electric utility (JIRAMA) in Madagascar, University of Antananarivo, Madagascar (Co-supervisor)

Francis Kemausuor (2015). Assessment of technical potential and selected sustainability impacts of second generation bioenergy in Ghana, KNUST, Ghana (co-supervisor).

PhD supervision - ongoing

Elder Davy (2017-2021). Capability transfer and upgrading in PV value chains in Sub Saharan Africa, UDP (main supervisor)

Teaching and capacity building

Co-supervisor for a number of Danish and international master students.

Teacher and supervisor at the Danida Fellowship Centre Course “Green Energy and Low Carbon Development” 2013, 2014, 2015, 2016.

Main responsible for TNA training and capacity building workshops in Senegal (2016, 2015, 2012), Mali (2011), including development of presentations and training material.

Development of three modules in TNA E-learning course.

On the job training and capacity building in a number of projects in SSA.

Project management experience (selected)

Title	Role	Client/Funder	Period
Tendering sustainable Energy Transitions (TENTRANS)	Project manager	Danida, FFU	2018-20
Supporting sustainable mini-grid development and partly local production of wind turbines in Kenya	DTU project manager	Danida, DMDP	2017-22
Exploring the development of large-scale solar power in SSA	Project manager	UNEP/Danida	2016-17
Development of technology specific methodologies for tech transfer within solar PV	Project manager	UNEP/Danida	2014-16
Technology Needs Assessment (TNA) project (Phase I)	Africa coordinator, 12 countries	UNEP/GEF	2010-13
Feasibility of Renewable Energy Resources in Mali	Project manager	Danida	2008-12

Language skills: (1 = excellent, 5 = basic) or mother tongue

Language	Reading	Speaking	Writing
Danish	Mother tongue	Mother tongue	Mother tongue
English	1	1	1
French	1	2	2
Spanish	2	3	3
German	3	4	4

Peer reviewed journal papers (21 indexed in Scopus, 19 indexed in WoS).

- Kruger, W., Nygaard, I., & Kitzing, L. (2021). Counteracting market concentration in renewable energy auctions: Lessons learned from South Africa. *Energy Policy*, vol 148, [111995]. <https://doi.org/10.1016/j.enpol.2020.111995>
- Hansen, U.E.; Nygaard, I.; Maso, M.D. (2021). The dark side of the sun: solar e-waste and environmental upgrading in the off-grid solar PV value chain. *Industry and Innovation*. Vol 8. no. 1, p. 58-78
- Pedersen, M.B.; Wehrmeyer, W; Nygaard, I (2020). Commercial yet social: The practices and logics of bringing mini-grid electricity to rural villages in Kenya. *Energy Research and Social Science*, 68, [101588] <https://doi.org/10.1016/j.erss.2020.101588>
- Hansen, U.E.; Nygaard, I.; Morris, M.; Robbins, G. (2020). The effects of local content requirements in auction schemes for renewable energy in developing countries: A literature review. *Renewable and Sustainable Energy Reviews*, 127, [109843] <https://doi.org/10.1016/j.rser.2020.109843>

- Nygaard, I.; Bolwig, S. (2018). The rise and fall of private sector investment in the Jatropha value chain in Ghana. *Environmental Science and Policy*, Vol. 84 p. 224-234
- Hansen, U. E., Nygaard, I., Romijn, H., Wieczorek, A., Kamp, L. M., & Klerkx, L. (2018). Sustainability transitions in developing countries: Stocktaking, new contributions and a research agenda. *Environmental Science and Policy*. Vol. 84, p. 198-203.
- Ockwell, D.; Byrne, R.; Hansen, U.E.; Haselip, J.; Nygaard, I. (2018). The uptake and diffusion of solar power in Africa: Socio-cultural and political insights on a rapidly emerging socio-technical transition, *Energy Research and Social Science* Vol. 44, 122-129
- Pedersen, M.B.; Nygaard, I. (2018). The role of private mini-grid developers as system-builders in Kenya's rural electrification regime, *Energy Research and Social Science* Vol. 42, 211-223
- Schaer, C.; Thiam, M.D.; Nygaard, I. (2018) Flood management in urban Senegal: an actor-oriented perspective on national and transnational adaptation interventions. *Climate and Development*, Vol. 10 (3), p. 243-258
- Nygaard et al (2017) Feasibility of wind power integration in weak grids in non-coastal areas of Sub-Saharan Africa: the case of Mali. *AIMS Energy*, Vol 5, (3), p 557-584
- Nygaard, I.; Hansen, U.E.; Pedersen, M.B.; Mackenzie, G. (2017). Measures for diffusion of solar PV in selected African countries. *International Journal of Sustainable Energy*, Vol. 36, No. 7, p. 707-721
- Andriantahina, T., Ravalison, F.A., Nygaard, I., (2017). Performance of Jirama, a state owned electricity company in Madagascar: A literature review. *Journal of systems and industrial project engineering*, Vol. 3, 123–131.
- Andriantahina, T., Ravalison, F.A., Nygaard, I., (2017). Improving the Treasury of Jirama , a state owned company in Madagascar by benchmarking. *Journal of systems and industrial project engineering* Vol. 3, 110–122.
- Nygaard, I.; Dafrallah, T. (2016): Utility led rural electrification in Morocco: combining grid extension, mini-grids, and solar home systems. *WIREs Energy Environ*, Vol. 5, No. 2, 2016, p. 155–168
- Nygaard, I. et al. (2016) Lignocelluloses residues for production of electricity or second generation biofuel: A case study of technical and sustainable potential of rice straw in Mali. *Renewable & Sustainable Energy Reviews*, Vol. 61, 2016, p. 202–212
- Nygaard, I.; Hansen, U.E. (2015): The conceptual and practical challenges to technology categorisation in the preparation of technology needs assessments. *Climatic Change*, Vol. 131, issue: 3, p. 371-385
- Francis Kemausuor; Ivan Nygaard; Gordon Mackenzie (2015). Prospects for bioenergy use in Ghana using Long Range Energy Alternative Planning model. *Energy*, Vol. 93, No. Part 1, 2015, p. 672–682
- Hansen, U.E.; Pedersen, M.B.; Nygaard, I. (2015): Review of solar PV policies, interventions and diffusion in East Africa. *Renewable & Sustainable Energy Reviews*, Vol. 46, p. 236-248
- Hansen, U. E.; Nygaard, I. (2014): Sustainable energy transitions in emerging economies: The formation of a palm oil biomass-to-energy niche in Malaysia 1990-2011. *Energy Policy*, Vol. 66, p. 666-676
- Hansen, U. E.; Nygaard, I. (2013): 'Transnational linkages and sustainable transitions in emerging countries: Exploring the role of donor interventions in niche development'. *Environmental Innovation and Societal Transitions*, Vol. 8, p. 1-19

- Nygaard, I. (2010): Institutional options for rural energy access: Exploring the concept of the multifunctional platform in West Africa, *Energy Policy*, Vol 38, No 2, 1192-1201
- Nygaard, I.; Rasmussen, K.; Badger J.; Nielsen, T. T.; Hansen, L.; B., Stisen; S., Larsen; S., Mariko; A., Togola, I. (2010): Using modeling, satellite images and existing global datasets for rapid preliminary assessments of renewable energy resources: The case of Mali. *Renewable and Sustainable Energy Review*. Vol. 14, 2359–2371
- Nygaard, I. (2009): Compatibility of rural electrification and promotion of low-carbon technologies in development countries - the case of Solar PV for Sub-Saharan Africa. *European Review of Energy Markets*. Vol 3, No 2, 125-158
- Nygaard, I. (2008): External support to local institutions – Providing political leverage to weaker groups or sustaining traditional relations of power. *European Journal of Development Research*. Vol 20, No 4, 649-665

Selected publications

- Morris, M., Robbins, G., Hansen, U. E., & Nygaard, I. (2020). Energy and Industrial Policy Failure in the South African Wind Renewable Energy Global Value Chain: The political economy dynamics driving a stuttering localisation process. PRISM Working Paper, No. 2020-3
- Hansen, U. E., Nygaard, I., Davy, E., Larsen, T. H., & Wabuge, C. W. (2019). Challenges to establishing and sustaining local production of renewable energy technologies in Sub-Saharan Africa. UNEP DTU Partnership
- Hansen, U. E., & Nygaard, I. (Eds.) (2019). Trade in Environmentally Sound Technologies in the East African Region. United Nations Environmental Programme
- Nygaard, I., Hansen, U.E., Larsen, T.H., Palit, D., Muchunku, C., 2018. Off-grid Access to Electricity Innovation Challenge, in: Jørgensen, B.H., Andersen, K.K. (Eds.), *Accelerating the Clean Energy Revolution - Perspectives on Innovation Challenges*. The Technical University of Denmark, Copenhagen, Denmark, pp. 47–54.
- Nygaard, Ivan; Hansen, Ulrich Elmer; Larsen, Thomas Hebo (2016). The emerging market for pico-scale solar PV systems in Sub-Saharan Africa: From donor-supported niches toward market-based rural electrification. UNEP DTU Partnership.
- Adomdza, G.K. McBagonluri, F; Kemausour, F. Nygaard. I.; Hansen, U.E.; Lauritzen, H. (2016) Exploring product development possibilities and alternative uses of PV solar cells in Ghana. Department of Energy Management and Storage, DTU.
- Nygaard, I.; Hansen, U.E. (2015): *Overcoming Barriers to the Transfer and Diffusion of Climate Technologies*, second edition, UNEP DTU Partnership, Technical University of Denmark
- Christensen, J.M.; Mackenzie, G.; Nygaard, I.; Pedersen, M. B. (2015) *Enhancing Access to Electricity for Clean and Efficient Energy Services in Africa*, UNEP DTU Partnership, Copenhagen, Denmark
- Hansen, E., Nygaard, I., Pedersen, M.B. (2014) *Prospects for investment in large-scale, grid-connected solar power in Africa*. UNEP Risø Centre, Technical University of Denmark
- Nygaard, I.; Nørgård, P.; Dewilde, L. et al. (2012): *Screening of feasible applications of wind and solar in Mali: Assessment using the wind and solar maps for Mali*, UNEP Risø Centre, Technical University of Denmark

- Haselip, J., Nygaard, I., Hansen, U., Ackom, E. (2011) (Eds.) Diffusion of renewable energy technologies: case studies of enabling frameworks in developing countries. Technology Transfer Perspectives Series, UNEP Risø Centre, Denmark

Selected presentations

- Nygaard, I. (2019): The risk of uneven transition: the case of South Africa. Research and Policy Workshop, Institute of Advanced Sustainability Studies (IASS), Potsdam, Germany, 28-29 November, 2019
 - Nygaard, I. (2019): Scaling up private sector investments for an ambitious energy transition in Africa. Africa Climate Week, Accra, 20-22 March, 2019
 - Nygaard, I. (2018): Off-grid access to electricity innovation challenge. Presentation at the Nordic Clean Energy week at the conference: Mission Innovation Challenges Accepted – What’s Next, Copenhagen 2018.
 - Nygaard, I. (2016): Niche development and upgrading in the PV value chain: The case of local assembly of PV panels in Senegal. Presentation at EU-SPRI Conference, Exploring new Avenues for Innovation and Research Policies, Lund 2016.
 - Nygaard, I. (2015): Private sector investment in the biofuel value chain in in Ghana seen in an innovation system perspective, Presentation at the International Sustainability Transitions Conference, SPRU, Sussex, August 2015
 - Nygaard, I. (2014): Prospects for investments in large-scale, grid connected solar energy in Africa. Presentation at the Danida conference: Opportunity Africa: Sustainable Energy Investment in Africa, UN City, Copenhagen, June 2014.
 - Nygaard, I. (2014): Measures identified in technology action plans to enhance national capacity: The case of Solar PV in Africa. UNFCCC (Technology Executive Committee) workshop on strengthening national systems of innovation in developing countries, Bonn, Germany.
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