

# Conference Program and Practical Information

## Governing sustainability of bioenergy, biomaterial and bioproduct supply chains from forest and agricultural landscapes

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Copenhagen, 17- 19 April, 2018



Sustainability impacts of biomass production  
Policies and governance systems to assure sustainability of bio-based supply chains  
Data and methodologies to verify sustainable practices  
Stakeholder perceptions and engagement in relation to sustainability governance



IEA Bioenergy



The conference is arranged by the following research networks:

- IEA Bioenergy Task 43 “Biomass feedstocks for bioenergy markets”
- SNS-NKJ network activity “Effect of bioenergy production from forests and agriculture on ecosystem services in the Nordic and Baltic landscapes”
- CAR-ES III “Centre of Advanced Research on Environmental Services from Nordic Forest Ecosystems”.

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More practical information – see conference website  
<http://ign.ku.dk/bioenergy-conf-2018/>

### **Editing of the program**

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### **Photo acknowledgements, front page**

Johannes Ravn Jørgensen, Aarhus University, and Inge Stupak, University of Copenhagen

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- Martyn Futter, Associate Professor, Dept. of Aquatic Sciences and Assessment, Swedish University of Agricultural Sciences (SLU)  
Kaija Hakala, Senior Scientist, Natural Resources Institute Finland (LUKE)
- Martin Junginger, Professor, Geosciences, Utrecht University, Netherlands. Coordinator of IEA Bioenergy Task 40  
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## Overview of conference program

### Venue:

University of Copenhagen  
Thorvaldsensvej 40, 1871 Frederiksberg C.  
Room: Auditorium A2-70.04

### Tuesday, 17 April

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#### 09.00 Registration opens

10.00 Welcome  
*Vivian Kvist Johannsen, Head of Section of Forest, Nature and Biomass, Institute of Geosciences and Natural Resource Management, University of Copenhagen*

#### Session I – Governing sustainability bioenergy, biomaterial and bioproducts based on agricultural crop and residue production, and regional approaches.

*Joint chair and moderator: Maria Wellisch and Kaija Hakala*

- 10.15 Bioenergy risk and risk management in the Nordic countries (1)  
*Nicholas Clarke, Anders Chr. Hansen, Atle Wehn Hegnes*
- 10.30 Agricultural Sustainability Governance for the Canadian Bioeconomy (2)  
*Charles Lalonde and Maria Wellisch*
- 10.45 Sustainability governance of biofuel and bioeconomic development: Complexity and data barriers (3)  
*Jianbang Gan, Inge Stupak, Tat Smith*
- 11.00 Improvements in nutrient and carbon retention in soils through energy crop integration into agricultural croplands (4)  
*Shyam Nair, Michael Griffel, Damon Hartley, Gabe McNunn, and Ross Kunz*
- 11.15 Drivers and effectiveness of sustainability governance of the Danish bioeconomy with respect to agricultural biomass production (5)  
*Niclas Scott Bentsen, Inge Stupak*
- 11.30 Spatially explicit modelling of biological productivity and economic attractiveness of short rotation woody crops (6)  
*John Stanturf, Tim Young, James Perdue*

#### 11.45 Lunch, served in the hall outside the conference room

12.45 Dialogue I: Governing sustainability bioenergy, biomaterial and bioproducts based on agricultural crop and residue production  
*Rapporteur: Vita Tilvikienė*

#### Session II – Governing sustainability bioenergy, biomaterial and bioproducts based on agricultural crop and residue production, and regional approaches.

*Joint chair and moderator: Kay Schaubach and Virginia Dale*

- 14.15 Environmental and economic analysis of novel perennial biogas crops (7)  
*Moritz Wagner, Andreas Kiesel, Anja Mangold, Iris Lewandowski*
- 14.30 The sustainability of growing agricultural energy crops in changing climate perspective (8)  
*Vita Tilvikienė, Virmantas Povilaitis, Kęstutis Venšlauskas*

**14.45 Coffee break**

- 15.00 Governing sustainability during the different phases of German biogas sector development (9)  
*Kay Schaubach, Thomas Horschig, Daniela Thrän*
- 15.15 Multi-objective optimization modelling of bioenergy systems and landscape design (10)  
*Nathaniel K. Newlands, David Lee, Edmund K. Mupondwa, David Zamar, Bhushan Gopaluni, Shahab Sokhansanj*
- 15.30 Regional governance models: Novel multi-stakeholders approaches (11)  
*Rocio Diaz-Chavez and Jinke van Dam*

**15.45 Short break**

- 16.00 Dialogue II: Developing and governing sustainability of biogas production and bioenergy feedstock production at broader landscape and regional scales  
*Rapporteur: Keith Kline*

**Session III – Posters**

*Chair: Søren Larsen, (please send one slide for a pitch talk to [ism@ign.ku.dk](mailto:ism@ign.ku.dk) and/or [sla@danskenergi.dk](mailto:sla@danskenergi.dk))*

- 17.30 Poster presentations, 1 min and 1 slide per poster. Poster presenters, please meet Søren by the blackboard in the conference room immediately after the dialogue session.

**17.50 Poster session and drinks, in the hall outside the conference room**

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## Wednesday, 18 April

**Session IV - Governing sustainability of forest-based bioenergy**

*Joint chair and moderators: Nicholas Clark and Søren Larsen*

- 09.00 Trust and legitimacy in governance of sustainability of bioenergy supply chains (12)  
*Maha Mansoor, Inge Stupak, Tat Smith*
- 09.15 Forest certification in the context of different national regulatory frameworks – a comparative analysis of the identified non-conformities (13)  
*Liviu Nichiforel, Bogdan Buliga, Ramona Elena Scriban*
- 09.30 Governance and issues related to wood-based pellet production in the Southeast United States (14)  
*Virginia Dale, Keith Kline, Esther Parish, Don Hodges and Neelam Pouydal*
- 09.45 Governance of sustainable forest management and bioenergy in Ontario, Canada (15)  
*Quentin Cheung and Tat Smith*

**10.00 Coffee break**

- 10.15 Sustainability Assurance Systems for Woody Biomass (16)  
*Christian A. Rahbek, Ondřej Tarabus*
- 10.30 Sustainability of wood-based biomass supply chains - the role and practical application of certification (17)  
*Simon Armstrong*
- 10.45 Experiences with, and challenges in, Danish biomass sustainability governance – an industry perspective (18)  
*Sune Balle Hansen, Anders Evald*

11.00 Avoiding deforestation in the tropics through governance of global supply chains (19)  
*Asger Strange Olesen and Simon Bager Laursen*

11.15 Dialogue IV: Governing sustainability forest biomass and bioenergy  
*Rapporteur: Martyn Futter*

**12.45 Excursion: Forest bioenergy and ecosystem services - excursion to forests of Sorø Academy**

Departure 12.45 from Thorvaldsensvej 40, DK-1871 Frederiksberg, Denmark. This is just outside the building where the conference takes place. We bring lunch bags and water, and plan to have lunch in the bus. It takes about 1 hour to drive to Sorø.

12.45 Driving to Sorø, lunch in the bus, talk about the Danish Industry Agreement and its implementation, by Søren Larsen, Danish Energy Association, and Christian A Rahbek, NEPCon.

13.45 Arrival at Sorø Academy, welcome and introduction.

14.15 In the forest: harvesting of biomass for energy from different forest sources and nature types, impacts of sustainability regulations on management, including the Danish Industry Agreement for sustainable wood chips and wood pellets.

16.15 Suserup forest: Unmanaged forest in Denmark; biodiversity and carbon storage.

17.30 Driving back to Copenhagen, continued talk about unmanaged forest and the wider perspectives around conservation, carbon, bioenergy and climate change, among other, in relation to the Danish Industry Agreement, by J. Bo Larsen

**18.45 Arrival at Restaurant Toldboden**

Address: Nordre Toldbod 18-24, 1259 København K, <http://toldboden.com/>

## Thursday, 19 April

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### Session V – Improving sustainability of the production of forest biomass for bioenergy, biomaterial and bioproducts

*Joint chair and moderator: Tat Smith and Marjo Palviainen*

09.00 Storylines for future biomass outtake from agriculture and forestry in the Nordic countries (20)  
*Martyn Futter, Dennis Collentine, Seppo Hellsten, Katri Rankinen, Jan Vermaat*

09.15 Forest guidelines for sustainable forest harvesting residue removals: An international review (21)  
*B. D. Titus, K. Brown, I. Stupak, H.-S. Helmisaari, V. Bruckmann, A. Evans, E. Vanguelova, N. Clarke, et al.*

09.30 Evaluation of the potential impact of small-forest sized forest machinery on greenhouse gas emissions in energy sector (22)  
*Santa Kalēja and Andis Lazdiņš*

09.45 Logging residue harvest in coniferous final felling and thinning stands: Effects on soil organic matter properties (23)  
*Aino Smolander, Tiina Törmänen, Veikko Kitunen*

10.00 Impacts of bioenergy harvesting on heavy metal load from peatland forests (24)  
*Liisa Ukonmaanaho*

10.15 Bioenergy production side product wood ash for forest fertilization – results of social active persons survey (25)  
*Dagnija Lazdina, Andis Lazdiņš, Modris Okmanis, Kalvis Pužulis*

**10.30 Coffee break**

10.45 Dialogue V: Sustainable forest management research as part of adaptive forest management and governance  
*Rapporteur: John Stanturf*

**12.15 Lunch break, in the hall outside the conference room**

**Session VI - Perceptions and communication of sustainability of bioenergy**

*Chair and moderator: Martin Junginger*

13.15 Gaps in sustainability tools and schemes for bio-based products and stakeholders preferences and expectations (26)  
*Sergio Ugarte, Stefan Majer, David Moosmann, Luana Ladu, Simone Wurster*

13.30 The European Union Timber Regulation (EUTR) – Compliance behavior analysis of German timber traders (27)  
*Steven Doerr*

13.45 Stakeholder perceptions on bioenergy development in Midwestern U.S. state of Iowa (28)  
*Keith L. Kline, Virginia H. Dale, Tom L. Richard, Douglas L. Karlen, William W. Belden*

14.00 Stakeholder perception and influence in the German biogas sector (29)  
*Kay Schaubach, Thomas Horschig, Daniela Thrän*

14.15 Positions, perceptions and influence of stakeholders on bioenergy sustainability (30)  
*Thuy Mai-Moulin, Uwe Fritsche, Ulrike Eppler, Martin Junginger*

**14:30 Coffee break**

14.45 Dialogue VI with supra-national stakeholders: Future pathways and strategies for sustainable bioenergy development

**16:15 Break**

16.45 Round-off

17.15 End of conference

## Posters

No.	Presenter	Title
P1	Andreas Nicolaidis	Resource management in the bioeconomy – a system dynamic approach for sustainable food <i>Andreas Nicolaidis</i>
P2	Keith L. Kline	Understanding indirect effects of bioenergy: Science-based ILUC Assessment <i>Keith L. Kline, Hans Langeveld, Virginia H. Dale, Rebecca A. Efrogmson</i>
P3	Per Bjerager	WOOD-CO <sub>2</sub> . A key figure for wood CO <sub>2</sub> -footprint <i>Per Bjerager</i>
P4	Kristaps Makovskis	The influence of design and management technology on hybrid aspen - perennial grass agroforestry system productivity <i>Dagnija Lazdina, Sarmite Rancane, Toms Sarkanābols, Kristaps Makovskis</i>
P5	Peter Musinguzi	Integrating Kenyan smallholder beekeepers in local bio-enterprise initiatives: Socio-economic hindrances to rural livelihoods improvement and sustainability of bio-based economic solutions <i>Peter Musinguzi, Aske Skovmand Bosselmann, Mariève Pouliot</i>
P6	Johanny Perez Sierra	Lessons learned in the German biogas sector: Expert's perceptions for a resilient risk governance in biogas <i>Johanny Perez Sierra, Claudia Bieling, Cordula Kropp, Dirk Scheer</i>
P7	Inge Stupak	Governance of environmental sustainability of manure based centralized biogas production in Denmark <i>Teodorita Al Seadi, Inge Stupak, Tat Smith</i>
P8	Tiina Törmänen	How logging residues of different tree species affect soil nitrogen cycling after final felling <i>Tiina Törmänen, Antti-Jussi Lindroos, Veikko Kitunen, Aino Smolander</i>
P9	Arta Bardule	Variation of macro- and microelement occurrence in a fertilized juvenile hybrid aspen ( <i>Populus tremula L. x P. Tremuloides Michx.</i> ) tree rings. <i>Arta Bardule, Dagnija Lazdina, Lauma Busa, Arturs Viksna</i>
P10	Gintaras Šiaudinis	The effect of different fertilization types on common Osier's and cup plant's productivity in Western Lithuania <i>Gintaras Šiaudinis, Danutė Karčauskienė</i>
P11	Lina Beniusienė	The use of forest biomass for energy production in Lithuania <i>Lina Beniušienė, Diana Lukminė, Iveta Varnagirytė-Kabašinskienė, Kęstutis Armolaitis</i>
P12	Ari Lauren	Improving the financial performance of solid forest fuel supply using a simple moisture and dry matter loss simulation and optimization <i>Ari Laurén, Antti Asikainen, Jyrki-Pekko Kinnunen, Marjo Palviainen, Lauri Sikanen</i>
P13	Tat Smith	Long-Term Effects of Harvest Residues on Spruce-Fir Site Productivity Following Whole-Tree and Stem-Only Harvesting <i>Chris Preece, Charles Smith, Brian Roth, Russell Briggs, Ivan Fernandez</i>
P14	Marjo Palviainen	Effects of biochar on carbon and nitrogen cycling in boreal Scots pine forests <i>Marjo Palviainen, Frank Berninger, Kajar Köster, Viktor Bruckman, Jukka Pumpanen</i>
P15	Dennis Collentine	Trickle down impacts on water: Filtering bioeconomy storyline data from the national to the small catchment scale <i>Dennis Collentine, Jelena Rakovic, Ida Nordin, Katarina Kyllmar and Martyn Futter</i>
P16	Tonje Økland	Plant diversity and species abundances in two Norwegian spruce forest sites: Short-term effects of whole-tree harvesting and stem-only harvesting <i>Tonje Økland, Jørn-Frode Nordbakken, Holger Lange, Ingvald Røsborg, O. Janne Kjønaas, Kjersti Holt Hanssen, Nicholas Clarke</i>
P17	Edgars Jurmalis	Ecosystem services approach as contribution to sustainability governance in forest management <i>Edgars Jurmalis, Zane Libiete, Arta Bardule, Martins Lukins</i>
P18	Tat Smith	Feasibility of verifying sustainable forest management of secondary feedstocks to produce wood pellets in Southeastern USA and the Baltic States <i>Inge Stupak, C. Tattersall (Tat) Smith</i>
P19	Janis Ivanovs	The use of LiDAR and sentinel-2 data in the detection of wet depressions in forest on mineral soils <i>Janis Ivanovs and Andis Lazdins</i>
P20	Ben Larson	Family owners' restoration of longleaf pine forests around Enviva's Cottondale wood pellet plant <i>Ben Larson</i>
P21	John Stanturf	Show me research and demonstration sites for innovation <i>John Stanturf, Emile Gardiner, James Shepard, Ted Leininger, Erik Schilling, Stephen Schoenholtz</i>



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## List of participants

No	Name	Job title	Organization	E-mail
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## Conference excursion

# Production and harvesting of forest biomass and protection of forest with high nature values in Denmark

Wednesday the 18<sup>th</sup> of April 2018, Sorø, Denmark

### Excursion concept note

Denmark was almost completely deforested by the early 1800s, but two-three centuries of afforestation have resulted in a current forest cover of about 15%. About 18% of the forest area is state forest, 6% is under other public ownership and the rest is private. Collection of wood fuel was common until after the Second World War, when fossil fuels became the dominant. However, with the oil crisis in the 1970s the use of forest biomass for energy increased again and this trend has continued over the last decades.

The academic literature suggests that intensified harvesting could increase ecological risks to yield, carbon stores, soil fertility, and biodiversity. In 1985, a review of research from neighbouring countries was performed, and, based on this review, simple Best Management Practices for sustainable wood chip harvesting were mandated for state forests. The guidelines were recommended also for the management in private forests.

As wood imports started to increase during the 2000s, and the EU Commission published its recommendations for “sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling”, some countries and energy companies took initiative to put in place systems for certification and documentation of sustainable forest biomass. In Denmark, a voluntary agreement was concluded in 2014, with sustainable forest management and greenhouse gas emission reduction requirements for both domestic and imported biomass (Danish Industry Agreement). The implementation started in 2016, and it will be completed by 2019, with individual energy companies being responsible for the implementation and for showing compliance with the requirements.

The FSC and PEFC certification systems are accepted for showing compliance with the requirements, as is the Sustainable Biomass Partnership (SBP). SBP uses a formalised risk-based approach to verification, and allows the risk assessment to be conducted at a national level. A similar approach is used for FSC controlled wood. In both cases, the risk assessment for Denmark showed that there is specified risk for indicators that address High Conservation Value (HCV) of nature and biodiversity. This is also the case in most other countries. A large challenge therefore exists to identify areas with HCV and other biodiversity values, and define how they should be developed and managed.

In Denmark, it has been debated in the last years how such values can be promoted, and lately, the government decided to set-aside 13,000 ha of state forest as untouched. However, managed forests cannot immediately be converted into HCV forest with a high level of biodiversity values.

The aim of this excursion is to take a closer look at which forest biomass resources that are used for bioenergy in Denmark, discuss if the utilisation is sustainable, and how this is being verified as required by the Danish Industry Agreement. Special focus will be on the issue of HCV forests and biodiversity.

Some key questions may include:

- Which forest resources are being used, and is this utilisation sustainable? Are there any real dangers?
- Will production systems change to meet demands for forest biomass?
- Which regulations affect forest business and daily management the most, also in relation to requirements for sustainable forest biomass?
- What kind of documentation is needed from the forest owner, for the energy company to be able to show compliance
- What expertise and resources are needed for the forest management unit to manage such documentation?
- How meaningful are various requirements in a local context?
- How effective is the regulation in achieving its goals, based on experiences?
- Can governance for sustainable forest biomass help to reconcile all interests in the landscape?
- What should be the balance between strict regulation and forest owners' flexibility for their management?
- How can stakeholders best be involved?

#### **Excursion host**

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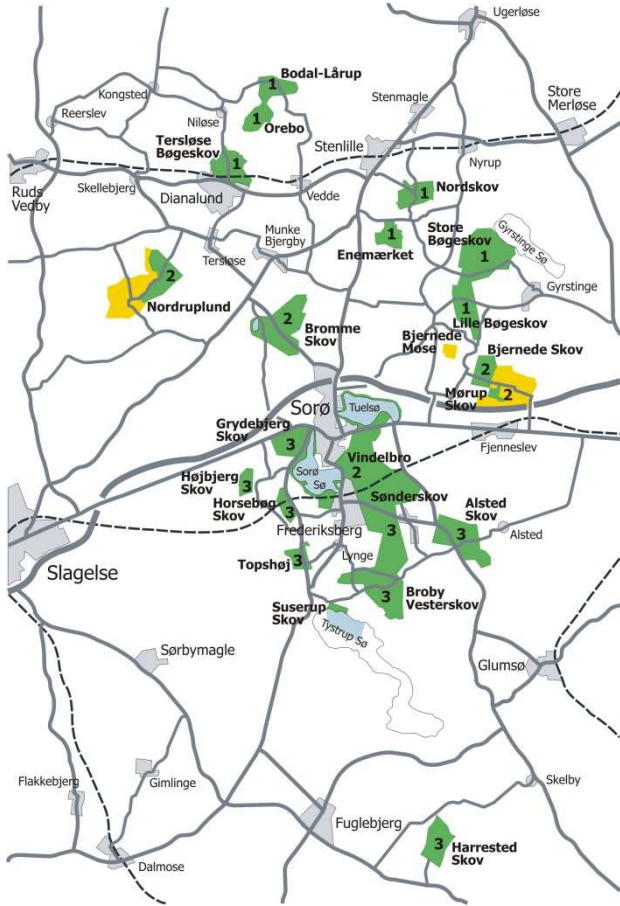
Director Jens Kristian Poulsen will be our host at Sorø Academy, and Professor, J. Bo Larsen will talk about unmanaged forests in Denmark, and their role for biodiversity conservation and carbon sequestration.

## Program

Departure 12.45 from Thorvaldsensvej 40, DK-1871 Frederiksberg, Denmark. This is just outside the building where the conference takes place. We bring lunch bags and water, and plan on having lunch in the bus. It takes about 1 hour to drive to Sorø.

- 12:45 Driving to Sorø, lunch in the bus, talk about the Danish Industry Agreement by Søren Larsen, Danish Energy Association, and Christian Rahbek, NEPCon.
- 13:45 Arrival at Sorø Academy, welcome and introduction to Sorø Academy.
- 14:15 Sorø Academy: Harvesting of biomass for energy from different forest sources and nature types, impacts of new sustainability regulations on management, including the implementation of the Danish Industry Agreement
- 16:15 Suserup forest: Unmanaged forest in Denmark. Which biodiversity do we want to promote and protect, and the tradeoff between biodiversity and carbon storage in unmanaged forest.
- 17:30 Driving back to Copenhagen, continued talk unmanaged forest. The tradeoff between establishing and protecting unmanaged forest, and what is the role of unmanaged forest in relation to the Danish Industry Agreement, by J. Bo Larsen.
- 18:45 Arrival at Restaurant Toldboden, Nordre Toldbod 18-24, 1259 København K

## Forestry at the foundation Sorø Academy's forests



Forestry is the most important income at the foundation Sorø Academy. It is a commercial forest holding that has 18 full time employees. The forest area, including lakes, meadows, bogs etc., is 4,300 ha, with 3.400 being covered with trees.

The Sorø forests are known for the good growing conditions for European beech. The foundation has through the years used this opportunity to produce high quality beech timber for the furniture industry. Often natural regeneration is used, needing only a light soil preparation combined with ensuring a suitable access of light to the forest floor. The soil and the silvicultural system, with relatively short rotations, allow for production of attractive light beech timber.

Other tree species are also cultivated, including conifers, but after a devastating hurricane in December 1999, the foundation is increasing its share of broadleaves, now having one of the highest shares of broadleaves of any forest estate in Denmark. The foundation also produces Christmas trees and greenery, and owns one of the most well-known and well-studied unmanaged forests in Denmark (Suserup Skov), even if the main production system remains intensive forestry with production of high quality deciduous wood.

### Tree species distribution

