



## Curriculum Vitae

# Haakon Vennemo

Ph.D & Professor Economics

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### PROFILE

Haakon Vennemo, PhD and Professor, is an expert in environmental economics, energy economics and development issues, with a broad knowledge of macro and micro-economics in general. He has project experience from a large number of countries in Asia, Africa and Latin-America and is an experienced project manager as well as participant. In China he has a continuous project experience since 1996.

Haakon is also engaged in domestic Norwegian policy issues, where he primarily does economic analysis of options and policy suggestions of interest to the public and private sector; market analysis and evaluations. Energy, environment and welfare issues are important in his Norwegian portfolio, but he conducts work in a large number of areas. Haakon has taken part in several hundred policy research projects, and has been project manager in about a hundred. He is also a very experienced quality controller.

Haakon Vennemo has strong academic credentials and about 30 referee journal publications. He is Adjunct Professor of Economics at Oslo&Akershus University College

### ACADEMIC QUALIFICATIONS

2010 Adjunct Professor, Oslo&Akershus University College

1992, 1994,

1998, 2014/15 Post-doc studies, University of California, Berkeley

1992 Ph.D. in Economics, University of Oslo

1986 Master of Economics, University of Oslo

1980 Undergraduate studies in Liberal Arts, Luther College, Decorah, Iowa, USA

### LANGUAGE

Norwegian Mother Tongue

English Fluent

Portuguese Fair

## CV Haakon Vennemo

### WORK EXPERIENCE

- 2016- Chairman of the board, Vista Analysis
- 2014-2015 Research Affiliate, China Energy Group, Lawrence Berkeley National Laboratory, University of California, Berkeley
- 2010- Partner, Vista Analysis
- 2010- Professor, Oslo Business School HIOA
- 1998-2009 Director, Managing Director (1999, 2001) and Partner, ECON Analysis
- 1995-1998 Senior Research Fellow, ECON Analysis
- 1994-1995 Senior Research Fellow, Research Department, Statistics Norway
- 1992-1994 Research Fellow, Research Department, Statistics Norway
- 1991-1992 Research Affiliate, Department of Agricultural & Resource Economics, University of California, Berkeley
- 1987-1991 Senior Research Economist, Research Department, Statistics Norway
- 1986-1987 Research Economist, Research Department, Statistics Norway

### PROJECTS IN NORWAY AND EUROPE

- 2017 **Economic consequences of neglect and violence against children**  
*Ministry of children and equality*  
We estimate economic costs to society of neglected children and violence against children. The analysis is written to a government commission (NOU 2017:12) and published as an annex to its report.
- 2017 **Revised legislation for ports and docks**  
*Department of communications*  
Member of a government appointed commission to suggest revisions to the current legislation of ports, docks and waters in Norway.
- 2017 **Climate adaptation in Poland**  
*EEA Grants*  
We provide training and help design a strategy for climate adaptation in 106 Polish cities and towns. The training schedule involves 500 participants who each receive one week of training. With Polish Institute of Environmental Protection – National Research Institute. Project manager.
- 2017 **Demand side flexibility – A survey**  
*Nordic energy research*  
We present a survey and analytical discussion of options for demand side flexibility in the Nordic electricity market, as well as barriers and opportunities for demand side flexibility. Project manager.
- 2017 **The exposure of the Norwegian government to petroleum related assets**

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### *Greenpeace*

We evaluate the Norwegian public sector exposure to petroleum related assets. The exposure is drawn from several sources, including the Government Pension Fund Global (“the sovereign oil fund”), state own petroleum companies, and future tax revenue from petroleum production. We conclude that the Norwegian public sector seems to be significantly overweighted in petroleum related assets.

### 2017 **The sharing economy and the environment**

#### *Nordic Council of Ministers*

We investigate environmental consequences of ‘the sharing economy’. The sharing economy entails improved utilization of built capital, and sometimes better utilization of human capital. The improved utilisation of capital, in particular, reduces demand for investment, at least in the short run.

### 2016- **Alternatives to grid investments**

#### *Statnett and ENOVA*

Building electricity grids to meet peak electricity demand is expensive. We analyze other means of resolving the situation, including non-grid supply investments, lower peak demand, lower overall demand. Case studies of Oslo and Finnmark are included. Project manager.

### 2016- **Estimating the value of lost load in the household sector in Norway.**

#### *NVE and Statnett*

We carry out a contingent valuation study to estimate the value of lost load among households in Norway. Based on the study we suggest a revised formula for the value of lost load among households in Norway. Project manager.

### 2016 **Assessing wider economic benefits in eight transport projects**

#### *Nye veier*

The publicly owned company Nye veier, which finances transport infrastructure, is interested in assessing wider economic benefits related to eight projects in its portfolio. We provide advice and estimates using our modelling framework.

### 2016 **Guidance document on wider economic benefits in handbook V712.**

#### *Statens vegvesen*

We provide a check list for distinguishing which road transport projects have a potential for significant wider economic benefits and propose a text on treatment of wider economic benefits to be used in the next version of the handbook.

### 2016 **The sharing economy.**

#### *Ministry of Local Government and Modernisation*

The sharing economy may have profound consequences for productivity, social relations and the way we spend our lives. The project discusses important initiatives in the sharing economy in Norway, analyses the current importance in the economy and outlines its potential.

### 2016 **Green competitiveness.**

## CV Haakon Vennemo

### *Ministry of Climate and Environment*

In this project we identify opportunities for Norwegian industry in light of the green transformation that is in front of us. We quantify these opportunities in a macro-economic scenario. Besides, we discuss policies and strategies to support promising opportunities, and we analyze indicators of green competitiveness. Project Manager.

- 2016      **Grid investment in Sør-Rogaland.**  
*Statnett*  
Statnett is performing an economic analysis in the KVU-format of different investment alternatives for improving grid capacity in Sør-Rogaland. Improved grid capacity will improve security of supply. We perform quality control (KS) of the Statnett analysis. Project Manager.
- 2016-      **Wider economic benefits of E39 Lyngdal - Sandnes.**  
*Statens vegvesen*  
E39 Lyngdal - Sandnes is a major highway investment project in Norway. We analyse wider economic benefits of this project. The emphasis is on differences between the different corridors for the highway.
- 2016      **The impact of tying of financial services for economic efficiency.**  
*Forbrukerrådet*  
Banks in Norway follow the practice of tying different financial services together. From a theoretical standpoint it is not clear whether tying is efficient or inefficient. The practical question is which models have assumptions that fit better with the reality of financial services.
- 2015-16    **Grid investment in the north of Norway.**  
*Statnett*  
Statnett is performing an economic analysis in the KVU-format of different investment alternatives for improving grid capacity in Finnmark, the northernmost county of Norway. Demand in the area may increase if petroleum is found and develop in the Barents Sea. Besides, improved grid capacity will improve security of supply. We perform quality control (KS) of the Statnett analysis. Project Manager.
- 2015-16    **Who should transport criminal detainees.**  
*Ministry of Justice and Public Security*  
We perform an evaluation and a cost-benefit analysis of who should be given the task of transporting consigned inmates: The police or correctional officers.
- 2015-16    **Wider economic benefits of four transportation investments.**  
*Statens vegvesen*  
Wider economic benefits include productivity gains from external effects and alleviation of second-best disturbance that is not counted in standard cost-benefit analysis. Using our recently developed model of wider economic benefits we calculate the benefits of four transportation infrastructure projects in Norway, in Lofoten, between Molde and Ålesund, between Voss and Bergen, and outside Stavanger.

- 2015-16      **The impact of price portals in Norway.**  
*Forbrukerrådet*  
The consumer board (Forbrukerrådet) in Norway runs three price portals, in financial services, electricity, and dentistry services. We investigate whether the portals have lowered prices, reduced price dispersion and affected competition in other ways, e.g., increased the tendency of consumers to move between contracts.
- 2015      **Environmental costs of freight transport by rail and on sea.**  
*Statens vegvesen*  
Freight transport by rail and on sea are thought to be environmentally-friendly means of transportation. But what are in fact the environmental costs of these means? We investigate this question and estimate in some detail the environmental costs of freight transport by rail and on sea in Norway.
- 2015      **Pros and cons of a price portal for groceries.**  
*Forbrukerrådet*  
The idea of a price portal for groceries has been approved by parliament in Norway on the argument that transparent competition will force down prices, but the competition authority fears that the grocery chains will use it to implicitly agree on high prices. We discuss the pros and cons of a price portal. A key question is who has the least information about prices at present, the consumer or the grocery chains.
- 2015      **Liberalising regulation of property at ports and docks.**  
*KS*  
Ports and docks have traditionally been subject to detailed regulation, e.g., conserving how revenue is spent, the size of tariffs compared to expenses etc. Over time the areal requirement of ports have changed and the alternative cost of property has increased. We study the impacts of liberalized regulation that allows for flexible use of property.
- 2015      **Electronic monitoring of offenders in Norway.**  
*Ministry of Justice and Public Security*  
Electronic monitoring is used in Norway for sentences less than four months, and for the final four months of longer sentences. Several other conditions besides length must also be met. We evaluate electronic monitoring in Norway. A cost-benefit analysis is integrated into the evaluation.
- 2015      **The value of lost load for households in Norway.**  
*NVE*  
“Lost load” is electricity not supplied because of interruptions etc. How high is this value? The question is important since NVE uses the value of lost load in its regulation of grid providers. We reassess existing evidence on the value of lost load in Norway and recommend a value to use in the short run, as well as a way forward in the longer run. Project manager.
- 2015      **Grid investment in the SKL-region (Haugalandet) in Norway.**  
*Statnett*

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Statnett is performing an economic analysis in the KVU-format of different investment alternatives for improving grid capacity in the SKL area (“Haugalandet”) in Western Norway. Demand in the area is increasing. Besides improved grid capacity will improve security of supply. We perform quality control (KS) of the Statnett analysis.

- 2015      **Tromsø museum.**  
*Ministry of Finance and Ministry of Culture*  
Tromsø museum needs a new building and possibly a new location. Using economic analysis we evaluate different proposals for location and type of a new building. The project is part of the quality assurance regime (KS1).
- 2014-2015      **Replacing Coastal Guard vessels.**  
*Ministry of Finance and Ministry of Defence*  
Coastal Guard vessels of the Nordkapp category are nearing their retirement age. We study options for replacement. The project is part of the quality assurance regime (KS1).
- 2014      **Cost-benefit evaluation of NADAG.**  
*Statens vegvesen*  
NADAG is a database for information about soil quality and underground features, based on drillings. We analyze costs and benefits of establishing NADAG as opposed to maintaining bits and pieces of this information in different institutions.
- 2014      **The railway investment Ringeriksbanen and highway investment E16 Hønefoss.**  
*Jernbaneverket*  
We evaluate benefits and costs of the railway investment Ringeriksbanen separately and jointly with the highway investment E16 Hønefoss. Responsible for evaluation of private-public partnership models for finance and operation.
- 2014      **Evaluation of the retirement age in Norway.**  
*Ministry of Labour and Social Affairs*  
The legal pension scheme in Norway has kinks at 62 years, 67 years and 75 years. The question in this project is whether or not these kinks should change over time as the expected length of life changes. If so, how often and according to which rule should the kinks change?
- 2014      **Evaluation of the sex purchase act.**  
*Ministry of Justice and Public Security*  
Purchase of sex is prohibited by law in Norway. We evaluate impacts of the law. Our focus is the development of the sex market and the well-being of women that carry out prostitution.
- 2014      **Quality of price index for housing services.**  
*Norwegian Consumer Council (Forbrukerrådet)*  
The quality of the price index for housing services has been questioned. We examine its quality and representativeness in measuring housing price changes in Norway.

- 2013-2014    **Socio-economic impacts of social entrepreneurship (philanthropy).**  
*Ferd*  
The idea behind Ferd Social Entrepreneurs is to treat measures to improve the conditions of marginalized groups as investments that provide a return to society. The return is part social and intangible, part economic. We assess and measure the socio-economic return to Ferd social investments (philanthropy), the Social Entrepreneurs.
- 2013-2014    **Further economic analysis of upgrading the electricity grid in the greater Oslo area.**  
*Statnett*  
Statnett is contemplating an investment to upgrade the electricity grid in the greater Oslo area. We perform an economic analysis of alternative routes for the grid. Environmental values, housing values and costs are prominent factors of the analysis. Project manager.
- 2013-2014    **Environmental impacts of the APEC list of environmental goods.**  
*Ministry of Foreign Affairs*  
In WTO-negotiations certain lists are circulated with names and categories (HS-codes) of goods that are suggested to have positive environmental qualities and hence are candidates for tariff reductions. One such list is the APEC list. We assess the environmental properties of the goods on this list. Project manager.
- 2013-2014    **Pricing of geospatial data.**  
*Ministry of Local Government and Modernization*  
Geospatial data are examples of “public goods” – they cost little or anything to disseminate once they have been collected. In the past geospatial data in Norway has had a complicated pricing structure. We evaluate costs and benefits of making them accessible for free. Project manager.
- 2013            **Incarnation capacity in Southern Norway.**  
*Ministry of Finance and Ministry of Justice and Public Security*  
Several prisons in Southern Norway date from the 1860's, and others are worn down. The prison population is increasing. Using economic analysis we evaluate different proposals for replacing and increasing capacity in the region. The project is part of the quality assurance regime (KS1). Project manager.
- 2013            **2022 Winter Olympics in Oslo.**  
*Oslo Municipality*  
As part of the quality assurance regime (KS) of Oslo Municipality we evaluate the proposal to ask for a government guarantee to underwrite an application for 2022 Winter Olympics in Oslo. With Ernst&Young.
- 2013            **Pricing models for the services of Kartverket (Map Authority).**  
*Kartverket*

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Kartverket is required to generate revenue of its services. The current pricing model is complicated. We develop a pricing model that is transparent and consistent with economic principles. With Oeconomica. Project Manager.

2013 **Economic analysis of upgrading the electricity grid in the greater Oslo area.**

*Statnett*

Statnett is contemplating an investment to upgrade the electricity grid in the greater Oslo area. There are several conceptual alternatives including the choice of a 300 kV grid versus one of 420 kV. We perform an economic analysis and uncertainty analysis of the alternatives. Project manager.

2013 **Economic analysis of electricity grid cables to Germany and Great Britain.**

*Statnett*

Statnett is contemplating a major investment in cables under the sea, one to Germany and another to Great Britain. We perform quality assurance of the economic analysis of the investment. Project manager.

2012-2014 **Radar and sensor technologies for defence air space surveillance.**

*Ministry of Finance and Ministry of Defence*

As part of the quality assurance regime (KS1) we analyze the costs and benefits of different conceptual choices for radar and sensor technologies for defence air space surveillance. Project manager.

2012-2013 **User fees and taxes in air transport.**

*Ministry of Transport*

The Civil Aviation Authority of Norway charges user fees (gebyrer) for its individual-goods services. An alternative system would consist of sectoral excise taxes (sektoravgift). We discuss economic pros and cons of these two systems, as well as legal aspects.

2012-2013 **Impacts of Norwegian foreign trade, investment and development assistance on global ecosystems.**

*Ministry of Environment*

As a small open economy Norwegian foreign trade and investment as well as development assistance are likely to impact foreign (global) ecosystems. We describe some characteristics of the impacts. For instance, the extensive investment in international petroleum exploration is something that sets Norway apart from other countries. Project manager.

2012 **Costs of domestic violence.**

*Ministry of Justice and Public Security*

The socio-economic costs of domestic violence consist of resources used for prevention and treatment of domestic violence, and the (welfare) cost to affected individuals and their families. We estimate the costs of domestic violence in Norway.

2012 **Economic analysis of higher transmission capacity in Western Norway.**

*Statnett*



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We analyse benefits and costs of an investment project to strengthen transmission capacity in Western Norway. Project manager.

2012 **The economic significance of private equity firms.**

*Hercules Capital*

We investigate the economic significance of the private equity business in Norway.

2012 **Using the great recession for greening the budgets.**

*Nordic Council of Ministers*

The great recession has increased public sector deficits and led to a search for additional revenue. We ask whether countries have made use of the great recession for greening the budgets in the form of lower subsidies to dirty goods, and higher fees.

2012 **The market price of household waste for incineration.**

*A law firm*

We estimate a market price to use for household waste for incineration. We also provide economic reasoning behind the estimate. Project manager.

2012 **National capacity for tugging boats.**

*Ministry of Finance and Ministry of Fisheries and Coastal Affairs*

As part of the quality assurance regime (KS1) we analyze the costs and benefits of different conceptual choices for building national capacity for tugging boats.

2011-2012 **Urban planning of transport and environment in Kristiansand, Norway.**

*Ministry of Finance and Ministry of Transport*

As part of the quality assurance regime (KS1) we analyze the costs and benefits of different transport scenarios in Kristiansand, a medium sized town in Norway.

2011-2012 **Carbon leakage.**

*Ministry of Environment and Ministry of Trade and Industry*

Two projects conducted independently to evaluate the extent of carbon leakage if Norway pursues unilateral carbon pricing and/or a different price of electricity to industry compared to other countries.

2011-2012 **Location of bases for fighter planes.**

*Ministry of Finance and Ministry of Defence*

As part of the quality assurance regime (KS1) we analyze costs and benefits of different alternatives for locating the base or bases for fighter planes. Project manager.

2011 **User fees as an element of the Norwegian system of taxation.**

*The confederation of Norwegian enterprise*

There is little knowledge of the use of user fees in Norway. We estimate the revenue from user fees on Norwegian enterprises, and compare user fees in nine sectors to the actual costs of the services that the user fees are to cover. Implications of the current system, e.g., for cost control are examined.

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- 2011 **Railway investment in from Porsgrunn to Larvik – an economic analysis.**  
*Ministry of Transport and Ministry of Finance*  
The government of Norway is contemplating a major improvement in the railway line between the cities of Porsgrunn and Larvik, where the current line dates from 1881. The new route will shorten travel distances considerably, but will need tunnels and bridges to do so. As part of the KS regime of quality control we conduct a cost-benefit analysis of single-track and double track alternatives. Project manager.
- 2010-2011 **Management of the submarine U864.**  
*The Norwegian Coastal Administration.*  
The submarine U864, which was torpedoed in World War II, may contain mercury. Lifting it, or covering it on the seabed are two strategies for handling the environmental risk. The project evaluated the costs and benefits of these strategies as part of a “Konseptvalgutredning” (Concept Choice Report). With Holte Consulting.
- 2010-2011 **Planting Sitka pine along the coast of Norway – an economic analysis.**  
*The Norwegian association for forest management (Skogselskapet)*  
We examine the case for planting pine trees of the Sitka variety in limited areas along the coast of Norway. Economic benefits are easily dwarfed by the climate benefits of these trees. Sitka on just 100,000 ha goes a long way towards meeting Norway’s climate commitments for the next decade. Project manager.
- 2010 **A cost benefit analysis of petroleum exploration outside Lofoten.**  
*Ministry of Environment*  
As an input to a revised management plan for the area, Vista Analysis is asked to conduct a cost-benefit analysis of petroleum exploration and production in the ocean outside Lofoten. Responsible for probability assessments.
- 2010 **Tertiary industry in a sustainable economy.**  
*Association of trade and services*  
Sustainable development, e.g., 80% reduction of CO2 by 2050, will change society and the economy. What is the role of the tertiary industry in this? How will it change? What are the opportunities, where are the threats? The project is reported in a presentation at the annual conference of the association, and a report. Project manager.
- 2010 **Evaluation of KS1.**  
*Ministry of Transport*  
For some time, Norway has had a policy of subjecting large public projects to external quality control. The project evaluates whether this policy has been a success with respect to projects in the transport sector.
- 2010 **Standby helicopters – an economic analysis.**  
*Ministry of Justice and Ministry of Finance*  
As part of the KS regime of quality control the project asked what are the costs and benefits of purchasing a new float of standby helicopters for rescue operations at sea in Norway.

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- 2010      **An economic analysis of impacts of climate change in Norway.**  
*Government Commission, vulnerability to climate change*  
Climate change may lead to a wetter and warmer country in the second half of the century. We study economic impacts of climate change. Focus is on eight sectors, including primary industries, tourism, transport, insurance, electricity production, sewage, building capital and health. We also analyze welfare implications and distributional issues. Project manager.
- 2009      **EURO 2016 – an economic analysis.**  
*Ministry of Culture and Church Affairs, and Ministry of Finance*  
As part of the government regime for quality control of large public projects we provide advice and quality control of the proposal to bid for co-hosting EURO 2016 in Norway. Project manager for the economic analysis and cost-benefit evaluation.
- 2009      **Communication satellite for defense purposes.**  
*Ministry of Defense, Ministry of Trade and Industry, and Ministry of Finance*  
As part of the government regime for quality control of large public projects we provide advice and quality control of a suggested industrial solution for a communication satellite with defense purposes. Project manager for the economic analysis and cost-benefit evaluation.
- 2009      **Climate impacts in Norway**  
*Government Commission, vulnerability to climate change*  
The project, conducted jointly between Econ Pöyry, CICERO and Vestlandsforskning, surveys research on the impacts of climate change in Norway.
- 2008      **Greenhouse gas consequences of the government budget and macroeconomic policy**  
Norwegian Pollution Control Authority  
There is an interest in establishing the consequences for Norwegian greenhouse gas emissions of the annual government budget (short run) and macroeconomic policy along with economic drivers (long run). We analyse how useful the available macroeconomic models are for this purpose, and suggest improvements. Project Manager.
- 2008      **Concept note for clean energy fund.**  
*Norfund.*  
We analyse the potential for a clean energy fund in a Norwegian context.
- 2008      **Value creation in horse-racing.**  
*Det norske travselskap*  
We document the value added of Norwegian horse racing. Viewing the sector as a consolidated entity reveals a much higher value added than is commonly acknowledged. Project manager.
- 2008      **ICT common parts in the public sector.**

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### *Ministry of government administration and reform*

Common parts in ICT are often not used to their best potential in the public sector, leading to parallel development costs and unnecessary duplications. We suggest a typology and a cost-benefit framework for identifying ICT components that are common parts.

### 2008 **Further development of Norwegian continental shelf.**

#### *Ministry of trade and industry*

The project analyses the state of competition on the Norwegian continental shelf and discusses suggestions for improving competition.

### 2008 **Climate risks in telecom infrastructure.**

#### *Telenor*

Climate change is likely to inflict damage and costs on telecom infrastructure. We study and evaluate the risks that climate change poses to the infrastructure of Telenor in countries where they operate.

### 2008 **Energy strategy Telenor**

#### *Telenor*

Assistance to Telenor, the Norwegian telecom company, in developing their energy strategy.

### 2008 **Environmental strategy Petoro**

#### *Petoro*

Assistance to Petoro, the Norwegian petroleum company, in developing their environmental strategy.

### 2008 **Sør-Østerdalen as Green Economic Zone?**

#### *Regionrådet for Sør-Østerdalen*

Sør-Østerdalen, an inland region of Norway, has large forestry resources and some hydro resources, which provides a basis for renewable energy production. The region is interested in streamlining existing energy stimuli in order to establish what is called a Green Economic Zone in Sør-Østerdalen. Project manager.

### 2007 **The impact of globalization on Norwegian industrial structure.**

#### *Ministry of Trade and Industry Norway*

There is interest in analyzing what effect globalization will have on Norwegian industrial structure over the coming 20 years. Using a value-chain approach this study finds that the main driver of Norwegian structural change actually is demographics rather than globalization. However, globalization is important for selected industries.

### 2007 **Norwegian interests in a globalized world.**

#### *Ministry of Foreign Affairs Norway*

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As part of the Ministry's work on Norwegian interests in a globalized world, the Ministry has commissioned a report of factual information on Norway's position. The work refers to the following claims: Norway is small and rich, a vulnerable territory, a heterogenous and liberal society, a peace-minded and charitable society.

- 2007 **Biofuels – status and prospects.**  
*Ministry of Foreign Affairs Norway*  
The study surveys the literature on biofuels in order to answer three questions: What is the net impact on CO<sub>2</sub> of different technologies for producing biofuels; what is the net impact on food security; and what is possible impact on biodiversity. The study also considers how biofuels is considered in the context of WTO.
- 2005-2008 **Investing in fighter planes in Norway – an economic analysis.**  
*Ministry of Defense and Ministry of Finance Norway*  
A process to advice on an economic analysis for decisions carried out by the Ministry of Defense, and an independent cost-benefit analysis of the fighter plane investment alternatives. Phase I and II. Part of the government regime for quality control of large public projects. Project manager (phase I).
- 2005 **Social health costs of accidents and work related illness on the continental shelf.**  
*Petroleum Safety Authority Norway.*  
A study to estimate the social health costs of accidents and work related illness on the continental shelf. Excess mortality risk, work day loss and medical health care costs are the most important categories evaluated.
- 2005 **Evaluating the Overall Trade Restrictiveness Index.**  
*Norwegian Ministry of Foreign Affairs.*  
The Overall Trade Restrictiveness Index (OTRI) is developed by the World Bank to assess tariff and non-tariff barriers to trade. Expert advice on methodological aspects of the index in relation to Norway's position in the index, was provided. Project manager.
- 2005 **Drivers behind development of environmental technology.**  
*Norwegian Pollution Control Authority.*  
A study to assess the drivers behind the development of environmental technology. Links to public policy instruments emphasized.
- 2005 **The role of Norwegian power sector competence in development cooperation.**  
*NORAD.*  
Member of an expert group to discuss the issue and put forward recommendations. Project manager.
- 2004 **Analyzing PPP indices for education expenses in OECD-countries.**  
*Norwegian Ministry of Research and Education.*  
An analysis of whether PPP-indices gives a good indication of price differences for education across OECD-countries. Discusses the handling of quality of services in particular. Illustrates consequences of possible index choices.

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- 2004      **Analysing the development index Commitment to Development.**  
*Norwegian Ministry of Foreign Affairs.*  
A memo discussing the methodology behind the development index Commitment to Development, with particular emphasis on what affects Norway's position on the index. Project manager.
- 2003      **Evaluation of the "Lisboa indicators" – relevance for Norway?**  
*Ministry of Industry and Trade.*  
An evaluation of the Lisboa indicators developed by EU for benchmarking economic performance and industrial policy across countries. Their relevance for Norway is illustrated in text and examples.
- 2003      **External effects of maintaining a company headquarter in Norway.**  
*Law firms BHR and TKGL.*  
A study to evaluate the claim that the location of company headquarters carry positive effects to society that are external to the company (external effects). The evaluation is based on empirical evidence from the literature. Project manager.
- 2003      **The wealth tax: Impacts on non-listed family firms.**  
*Norwegian Employers' Association and Norwegian Shipowners' Association.*  
A project to discuss how the Norwegian wealth tax currently affects non-listed family firms. The project also discusses how a recent proposal to change the basis for the wealth tax affects non-listed family firms. Project manager.
- 2002-2003      **Benefits of ICT investments in the Norwegian Health Sector.**  
*Norwegian Agency for Health and Social Issues.*  
A project to discuss the benefits of ICT investments in the central Norwegian Health Sector. It discusses data availability and presents tentative quantitative estimates of benefits. Project manager.
- 2002      **Best in what? Benchmarking of Norwegian Industrial Policy.**  
*Norwegian Shipowners' Association.*  
A report commenting on a recent government commission that suggested indicators for benchmarking Norwegian Industrial Policy. Report suggested streamlining Norwegian criteria with Lisboa indicators. Project manager.
- 2002      **User fees in the health sector in relation to national priorities for allocation of health services.**  
*Norwegian Agency for Health and Social Issues.*  
A memo discussing how incentives implied by user fees interact with national priorities for allocating health services. Project manager.
- 2002      **The petroleum tax – a tax on human capital?**  
*The Petroleum Industry Association.*

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A project discussing to what extent petroleum revenue is the return to research and development as opposed to pure rent. To the extent that petroleum revenue is a return to research and development it is also the return to the human capital creating research and development outcomes. In this perspective a tax on petroleum revenue is a tax on the return to human capital, as opposed to being a tax of pure rent. Text and empirical illustrations. Project manager.

2002 **The Norwegian wealth tax: Impacts on savings, investments and ownership.**  
*Norwegian Employers' Association.*

A project discussing what are the impacts of the Norwegian wealth tax in its present design. Results show that the present tax amounts to a highly non-uniform tax on capital. Project manager.

2001 **A tax system with a difference.**

*Norwegian investment forum*

A study of an alternative system of capital income taxation. The system resembles a consumption tax, but with some adjustments. ECON investigated the economic efficiency properties of the system. Project manager.

2000-2001 **The design of the tax system in Norway in light of increasing international mobility.**

*Norwegian Shipowners' Association.*

A project discussing how the fact that a) goods and b) factors are internationally mobile should influence the taxation of goods and factors in Norway. Particular emphasis is put on capital mobility and capital taxation, but labour mobility is also assessed.

2000 **Advice on criteria for the CDM mechanism.**

*Ministry of Environment.*

Advice on improvements in the text on CDM to the COP-meeting, for the benefit of Norwegian suggestions to the text.

1999 **Positive effects of small upstream companies in the Norwegian Continental Shelf.**  
*Pelican*

1999 **Strategic Climate Change Policy Evaluation.**

*Vattenfall.*

1999 **Assessing the cost of accidents on the Norwegian Continental Shelf.**

The Norwegian Petroleum Directorate

1999 **Strategic input to a major Norwegian law firm.**

1998 **Evaluation of a proposal to introduce beer and softdrink cans in Norway.**

*Norsk Resirk.*

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- 1997-1999 **Integration of the North-European electricity markets: Consequences for efficiency and the environment.**  
*Norwegian Research Council – SAMRAM*
- 1997 **Evaluation of a proposal to introduce emission tax on emission quotas.**  
*The State Pollution Control Authority of Norway.*
- 1996-1997 **Environmental costs of plastic waste for incineration or Landfills.**  
*Norwegian Research Council – MILFOR*
- 1996-1997 **Evaluation of an emission fee for incinerators.**  
*The Ministry of Environment*
- 1995-1996 **Environmental costs of different components of waste.**  
Norwegian Research Council – within the programme «Environmental policy measures»
- 1995-1996 **Migration of polluting technologies.**  
*Nordic Council of Ministers*

### PROJECTS WITH A FOCUS ON THEORY, METHODS AND TOOLS

- 2017 **Bottom-up and top-down analysis for climate mitigation.**  
*Ministry of Finance and Ministry of Climate and Environment*  
The ministries asked for a comparison of bottom-up and top-down models of climate mitigation, and an assessment of the relation between economic costs of options and the dimension of the associated policy instruments.
- 2016- **Transport investments and multiple externalities.**  
*Norges forskningsråd TRANSPORT 2025*  
The project develops an analytical framework and modelling tools for analyzing the interaction between positive and negative externalities in terms of agglomeration, environmental pressures, congestion etc. in the transport system. We also develop an improved analytical model for effective density and agglomeration that is suitable for econometric estimation. Project manager (joint).
- 2016- **Estimating the value of lost load for Norwegian households**  
*NVE and Statnett*  
The value of lost load is an important part of Norwegian regulation of electricity grid entities. In this project, which follows on a feasibility study in 15, we use contingent valuation techniques to estimate the willingness to pay for recovering lost load among households. Project manager.
- 2015- **NORDICWELFAIR.**  
*NordForsk*



## CV Haakon Vennemo

The purpose of this research project is to develop improved estimates of the health damage of air pollution in the Nordic countries. Specifically, the research studies the components of small particles and hopes to develop individual damage estimates for each component, something which has not been done before. Vista is responsible for economic analysis. Project manager Vista.

2015 **The treatment of exchange rates in economic analysis.**

*Statnett*

The rates of exchange matter a great deal for the estimated net present values in many applied cost-benefit analyses. Yet they are quite volatile. Little guidance on how to treat the rates of exchange is available. We provide such guidance. Project Manager.

2015 **Discount rates for grid investments to supply new renewable energy.**

*Statnett.*

Quality control of a document presenting guidelines in Statnett for grid investments to supply new renewable energy. Includes independent analysis and calculations. Project Manager.

2013 **Economic model for Norway and Northern Norway.**

*Ministry of Industry and Trade.*

We develop a CGE type economic model for Norway and a regional dispersion model for Northern Norway. Compared to other Norwegian GGE models it has a regional dimension. Compared to other regional models impacts are embedded in, and constrained by nationwide supply constraints. The project is conducted jointly with the economic consultancy Menon.

2012-2014 **Handbook in economic analysis of electricity grid investment.**

*Statnett*

Based on general guidebooks in economic analysis we develop a handbook specifically targeted at electricity grid investments. Project manager.

2012 **Norwegian economic research into policies for innovation.**

*Norwegian Research Council RENERGI programme*

The project reviews the contributions of Norwegian research to a vibrant research field in economics, the endogenization of technology. Specifically we describe research on policies to encourage new renewable energy, energy savings and carbon reductions. Project manager.

2011-2012 **The treatment of systematic risk in cost-benefit analyses in Norway.**

*Concept programme, NTNU.*

Guidelines for cost-benefit analyses in Norway advises to treat risk by means of certainty equivalents that correct for systematic risk. However, there is little knowledge and no guidelines on how systematic risk is to be determined. The project determines systematic risk of major elements of cost and willingness to pay in generic projects. Project manager.

2011 **Determination of life time in cost-benefit analyses in Norway.**

## CV Haakon Vennemo

### *The Norwegian Coastal Administration*

In applied cost-benefit analysis the choice of life time is often made arbitrary. Norwegian practice in the transport sector is 25 years economic life time, with another 15 years technical life time. Other sectors have other rules. The project makes an argument for a coherent approach based on the principles of economics. Project manager.

- 2009      **How to face the risk of climate change in the context of climate adaptation.**  
*Government Commission, vulnerability to climate change*  
Early adaptation to climate change brings costs that are certain and benefits that are uncertain. How should these be balanced? The project discusses this problem and bridges principles with practical rules of behaviour. Project manager.
- 2006-2010      **Discount rates for energy investments.**  
*Norwegian Research Council with Enova, Statnett, Statoil and SSØ*  
A three year research project to analyse the risk-return tradeoff for energy investments and build a CAPM-based decision tool for making better investment decisions. Project manager.
- 2006-2007      **The relevance of social and economic research on energy matters.**  
*Norwegian Research Council.*  
A project to discuss the relevance of social and economic research on energy matters, emphasizing the commercial potential for social and economic research, and secondly the linkages between such research and energy efficiency improvements on the ground.
- 2004      **Economic research on the impact of research and innovation on productivity and growth. What do we know?**  
*Norwegian Ministry of Research and Education.*  
A workshop for the Deputy Minister explaining what the economics profession knows about this topic. Project manager.
- 2004      **Discount rates for power transmission investments.**  
*Statnett (the Norwegian power grid operator).*  
A study analysing how the discount rate in practice should be adjusted for risk. Uses an applied structural model of the Nordic power market to analyze the nature of systematic risk facing a transmission line.
- 2003-2005      **The precautionary principle: An economic interpretation.**  
*Norwegian Research Council.*  
A project to discuss an economic interpretation of the precautionary principle. The principle is interpreted as a risk management rule of thumb derived from the CAPM-model. The project consists of sub-projects describing a theoretical framework characterized by endogenous risk, and applying the principle to renewable energy investments. Project manager
- 2001      **How to value petroleum wealth.**

## CV Haakon Vennemo

### *Ministry of Energy*

Petroleum wealth is measured as the expected present value of the revenue stream from selling petroleum. At present the risk inherent in the present value is accounted for crudely by the discount rate. We discuss alternative ways of accounting for risk, including the certainty equivalent method. Project manager.

2000-2001 **The treatment of risk in cost-benefit analysis of environmental projects.**

*Ministry of Environment*

A project discussing how systematic risk should be accounted for in cost-benefit analyses of environmental projects. Empirical evidence on “beta” relevant for environmental projects sought from e.g., the relative performance of green stocks and bonds. Project manager.

2000 **Life-cycle Assessment: An economic perspective.**

*Norwegian Research Council.*

A research report analysing how economics might shape and improve life-cycle analysis. The welfare economic background for life-cycle analysis is discussed, and the theoretical and practical relation of life-cycle analysis to economic project assessment is analysed. Project manager.

1999-2000 **Increase knowledge on how policy instruments can promote new renewable energy technologies.**

*Research Council of Norway*

1997-1998 **Growth in future relative prices of certain non-market environmental goods and bads.**

*The State Pollution Control Authority of Norway*

1996-1997 **Valuing environmental effects in the long run.**

*Norwegian Research Council – MILFOR*

1992-1995 **Economy and Ecology - tools for a sustainable development.**

*Project Manager. Norwegian Research Council*

1991-1993 **Research Programme on Taxation.**

*Norwegian Research Council*

Project Manager. Consequences of taxing pure rent and environmental externalities

### **PROJECTS IN CHINA**

2016 **Incentivizing local communities for biodiversity conservation.**

*Ministry of Environmental Protection, China and Ministry of Foreign Affairs, Norway*

Protected areas in China are not always run well. This project is about providing improved incentives and suggesting state of the art practices to China. Vista Analysis is sub-contractor to the Environmental Directorate.

2015 **“China Council” Environmental Risk.**

*CCICED*

## CV Haakon Vennemo

China Council for International Cooperation on Environment and Development (CCICED) has initiated a Special Study on environmental risk. As an international expert I am a member of the editorial group.

- 2014-2015 **China's climate policy reform and corporate strategy: A business case for change.**  
*China Carbon Forum Limited*  
The purpose of this project is to understand the barriers and drivers shaping corporate behavior along the supply chain in China in terms of greenhouse gas emission reduction and environmental performance. A survey is carried out. Advisor.
- 2013- **Cost-effective prevention and control of environmental risk in China.**  
*Ministry of Environmental Protection, China and Ministry of Foreign Affairs, Norway*  
In the 12<sup>th</sup> five year plan (2012-16) it is an important priority for China's environmental authorities to reduce discharges of environmental hazards within a balanced framework of cost-effective reduction of environmental risk. This major cooperative project between Norway and China develops capacity in China's provinces for managing environmental risks in a comprehensive and cost-effective fashion. Project manager.
- 2013- **Urban Atmospheric Multi-Pollutant Prevention and Control in China.**  
*Ministry of Environmental Protection, China and Ministry of Foreign Affairs, Norway*  
Increasingly, air pollution in China is regional in source and comprehensive in type, covering several pollutants. China is just starting to struggle with these issues. This major cooperation project between Norway and China develops capacity for handling regional multi-pollutant emissions. Vista Analysis is sub-contractor to the Environmental Directorate (formerly Klif).
- 2011 **A national plan for reducing particulate matter pollution in China.**  
*The World Bank*  
Although air quality in Chinese cities is improving the situation is volatile and the level of pollution is still high. China's government has asked the World Bank for assistance in developing a plan that allows all of China's 660 cities to come into compliance with so-called class II air quality. The plan is based on cost-effective pollution control. Advisor.
- 2010-2013 **Diffusion of climate technologies.**  
*Norwegian Research Council*  
We study the diffusion of climate technologies, with a particular focus on diffusion of CCS from Norway to China. This question has a demand side, in terms of Chinese demand for CCS and Norwegian technology for CCS. Then it has a supply side in terms of Norwegian supply of CCS technology. The first phase of the project studies the demand side, followed by the supply side. With Statistics Norway and Development Research Center of State Council, China.
- 2010-2013 **Towards a low carbon energy future: Norway's policy opportunities and constraints in an international comparative perspective.**  
*Norwegian Research Council*

## CV Haakon Vennemo

How are stakeholders in China evaluating costs and benefits of promoting new renewable energy? We suggest that Chinese stakeholders view this question differently, just like the situation in the rest of the world. The project aims to map stakeholders and positions. With CICERO and Chinese Academy of Social Science, China.

2010-2011 **Environmental assessment of a Free Trade Agreement between China and Norway.**

*Ministry of Environment.*

Environmental assessments of free trade agreements are fairly common internationally, but so far rare in Norway. We develop a methodology and conduct an analysis of a potential free trade agreement with China. With FNI. Project manager.

2009-2012 **Conditions for change in international climate policy: The role of China, the US and the EU.**

*Norwegian Research Council*

Which are the driving forces that condition for change in the climate policy of China, the US and the EU? Which forces are of a preserving nature? How do the major players interact and to what extent are driving forces influencing each other? These are key questions of this research project led by FNI.

2009-2011 **Indoor air pollution: Implications for public health and society of promoting clean household fuels in China.**

*Norwegian Research Council*

This large research project lead by CICERO has components on measuring health status among rural poor in Guizhou Province, China; relating health status to indoor air pollution, and evaluating the impact of interventions in the form of clean stoves. Our contribution is on the cost-effect and cost-benefit of clean stoves.

2009 **Call for a green China.**

*The World Bank*

Four major Chinese cities were treated to a series of performances and conferences designed to raise awareness about these issues among new audiences in an innovative, multimedia format. Our contribution was to lecture the provincial audiences about the dangers and costs of water pollution in the provinces. See <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPENVIRONMENT/0,,contentMDK:21250451~menuPK:502904~pagePK:2865114~piPK:2865167~theSitePK:502886,00.html>

2008-2011 **Provincial five-year environmental plans**

*Norwegian embassy Beijing/Ministry of Foreign Affairs*

With Chinese institute Chinese Academy of Environmental Planning we analyse and advise on the effectiveness of current provincial five-year environmental plans. Based on best practice from Western countries and the principles of cost-benefit analysis we provide policy recommendations for improving the plans, turning them into effective tools for environmental management. Project Manager.

2008-2010 **China climate policy case study.**

*Norwegian Research Council and Statoil*

## CV Haakon Vennemo

The study analyses Chinese climate policy from a bottom up perspective. What is the likely development of Chinese climate policy? How does the game between internal actors play out? How is it influenced by outside events such as new information on costs and benefits of climate change mitigation?

- 2008      **Environmental consequences of Sino-Norwegian Free Trade Agreement**  
*Ministry of Trade and Industry*  
A Sino-Norwegian FTA is likely to have consequences for the environment. We analyse impacts from three angles: One is a macroeconomic angle, using a CGE model to demonstrate macro impacts. The other is a microeconomic angle, using a life cycle perspective to work out impacts of increased trade in fertilizer and cotton textiles. The third is a technology angle, discussing barriers and opportunities for Norwegian environmental technology vendors. Project Manager
- 2008      **China 2020**  
*Norwegian Consulate Guangzhou, China/Ministry of Foreign Affairs*  
A scenario process developing three scenarios for China in 2020 along political, economic and environmental/energy dimensions.
- 2008      **China climate policy case study.**  
*Norwegian Research Council and Statoil*  
The study analyses Chinese climate policy from a bottom up perspective. What is the likely development of Chinese climate policy? How does the game between internal actors play out? How is it influenced by outside events such as new information on costs and benefits of climate change mitigation? Project manager.
- 2007-2008      **Environment and conflict.**  
*Ministry of Foreign Affairs, Norway*  
This is a study of how environmental deterioration conditions for conflict, and how assistance in the building of peace may sever the links between environment and conflict. The study pays particular attention to the links between conflict and climate change. Case studies are carried out in Burkina Faso, China, Nepal and Sudan.
- 2007-2008      **Benefits and costs to China of a climate commitment.**  
*Ministry of Foreign Affairs Norway.*  
Continuing our advisory services on Chinese climate policy options the 2007-2008 period covers a study of triangular benefits (CO<sub>2</sub>-mercury-health), a study of rural energy use and a macroeconomic study of how alternative designs of a climate might affect China. Initiating a cooperation with the Counselors' Office of the State Council we will organize a Forum on energy, climate and environment. Scientific meetings with Chinese and international partners will also be held. Project manager.
- 2006-2009      **Capacity building for reducing mercury pollution in China.**  
*State Environmental Protection Administration of China (SEPA) and Ministry of Foreign Affairs Norway*

## CV Haakon Vennemo

Using Guizhou Province as a case study the project asks a) how large are current and projected emissions of mercury from different sources, b) what are deposition levels, c) which mitigation options are available, d) what are their costs, e) what are their effect in terms of mercury reductions and f) what are their co-benefits. The project is conducted jointly with Tsinghua University of China and Norwegian Institute of Water Quality Research (NIVA) of Norway.

- 2005-2006    **Advice on Green National Accounts in China.**  
*State Environmental Protection Administration, China*  
A process to advice on the design of Green National Accounts in China. Advice on economic valuation in particular. Project manager.
- 2005-2006    **Advisory services on climate policy in China in the second commitment period.**  
*Ministry of Foreign Affairs Norway*  
Continuing our advisory services on Chinese climate policy options in the second commitment period the 2005-2006 period covers a project to estimate in a macroeconomic CGE model the cost to China of “co-control”, that is simultaneous control of SO<sub>2</sub> and CO<sub>2</sub> (and PM<sub>10</sub> and CO<sub>2</sub>). The project also includes annual workshops. Project manager.
- 2005         **Guidance on developing a Strategic Environmental Assessment in Western China.**  
*The World Bank.*  
Expert advice on the SEA of the Great Western Development Strategy in China. Advice on conclusions and line of argument in particular. Project manager.
- 2004         **Managing protected areas in China for biodiversity and poverty alleviation.**  
*China Council for International Cooperation for Environment and Development.*  
Expert advice to the Protected Areas Task Force of the China Council. Topic of advice to make sure that linkages between management of protected areas and poverty alleviation are addressed. Project manager
- 2004         **Circular Economy: An interpretation.**  
*The World Bank.*  
A research note discussing how the concept of Circular economy relates to familiar environmental problems and how it may be tailored into constructive objects of analysis. Project manager.
- 2003-2004    **Determinants of hardware and software IT industry growth in China and India.**  
*International Finance Corporation.*  
A study discussing why the Indian software- and the Chinese hardware industries are successful, but Indian hardware and Chinese software are not. A survey of 320 hardware and software companies in China and India is central to the study. Project manager.
- 2003-2004    **Advisory services on climate policy in China in the second commitment period.**  
*Norwegian Ministry of Foreign Affairs.*

## CV Haakon Vennemo

A network of scientists and policy advisors on climate policy in China, the U.S. and Norway is established to discuss options for Chinese climate policy in the second commitment period. The discussion is facilitated by joint projects and an annual workshop. Topics include cobenefits of climate change mitigation, developing a policy framework for integrated assessment in China, cobenefits of mitigation of indoor air pollution, climate and environmental implications of macroeconomic policy. Project manager

- 2003-2005    **Environmental consequences of Chinese WTO-accession.**  
*Norwegian Research Council.*  
A study to analyze environmental consequences of Chinese WTO-accession. The study is model based, it employs a computable general equilibrium model of the Chinese economy. Project manager.
- 2002-2005    **Guidelines for environmental economic guidelines in EIAs.**  
*NORAD and State Environmental Protection Agency (SEPA).*  
A project to formulate guidelines for environmental economic indicators and principles of relevance for the EIA. It contains case studies on a power plant (air pollution), wastewater treatment (water pollution), wastewater irrigation (land and soil pollution) and highway construction (land changes), and builds recommendations on these. Project manager.
- 2001-2005    **Air quality management system for Shanxi Province, China.**  
*NORAD, Shanxi Environmental Protection Bureau and Norwegian Institute for Air Quality Research.*  
A project to develop a master plan for air pollution control in Shanxi Province. The plan is based on the Urbair concept for cost-benefit analysis of mitigation options. The concept models impact pathways to benefits. The starting point is scenarios for air quality ECON's contributions lie in cost estimation, valuation impacts and description of the scenarios in the master plan. Project manager.
- 2000-2007    **An environmental cost model for China.**  
*World Bank and SEPA.*  
A project aiming at estimating aggregate environmental costs, in monetary equivalents, of current economic activity in China. The estimate will revise an existing estimate from 1997. Environmental costs are related to air and water pollution. Impacts on human health, crops, forests, materials etc. are quantified at a provincial and national level. Project manager.
- 2002-2003    **Advisory services on a Strategic Environmental Assessment of the Great Western Development Drive, China.**  
*World Bank.*  
Advice and comments provided on a draft SEA-report written by the Chinese Research Academy of Environmental Science (CRAES) and Beijing Normal University. Project also included a talk at the Conference Reshaping Environmental Assessment Tools for Sustainability in Hong Kong. Project manager.
- 2001-2002    **Environmental challenges in China: Determinants of success and failure.**



## CV Haakon Vennemo

### *World Bank*

A report analysing three environmental problems in China: Phase-out of lead in gasoline has been dealt with successfully; local air pollution of SO<sub>2</sub> and particulates are currently considered with some success; ground level ozone is not dealt with at all. What determines these outcomes? Input to World Development Report 2003. Project manager.

### 2000-2003 **Co-benefits of climate measures in Shanxi.**

*Ministry of Foreign Affairs/Research Council of Norway*

A project examining local environmental benefits, so-called co-benefits, of measures directed at reducing carbon emissions in Shanxi Province, China. The measures considered are energy efficiency measures, clean coal measures and clean production measures. The project is documented in several peer-reviewed articles, see next section. Project manager.

### 2000-2003 **CGE-evaluation of a greenhouse gas restriction for China.**

*OECD.*

A project asking what a hypothetical greenhouse gas restriction implies for the Chinese economy as a whole. The project emphasises that a greenhouse gas restriction only brings costs, but benefits of better local air quality, which improves public health and increases agricultural yields. The analysis is based on a CGE-model analysis of the impacts of a greenhouse gas restriction on the Chinese economy. Project manager.

### 2000-2002 **The impact of green taxes on the poor in China.**

*China Council.*

A book discussing to what extent green taxes or fees hurt the poor in China in a disproportional way. Econometric analysis of national cross-sectional data, rural data from Shaanxi Province and a micro dataset from Guizhou Province. See section on publications. Project manager.

### 2000 **The Sea of Bohai – prefeasibility study.**

*NORAD and NDRC China.*

A memo outlining a possible Sino-Norwegian cooperation project on a Master Plan for the Bohai Sea. The memo also considers the interest on the Chinese and Norwegian sides and the likely success ratio of a project of this type. The recommendation to NORAD and NDRC is not to go ahead with the project. Project manager.

### 1998 **Assessing a Norwegian AIF project in China.**

*Norwegian Ministry of Foreign Affairs.*

### 1996-1999 **Air Quality Management System in Guangzhou, China.**

*NORAD*

### 1996-1997 **Towards an Integrated Environmental Management Plan for Chongqing, China**

*The China Council on International Co-operation on Environment and Development*

## PROJECTS IN OTHER DEVELOPING COUNTRIES

## CV Haakon Vennemo

- 2016- **Climate adaptation in Vietnam.**  
*Nordic Development Fund*  
We analyze incentive schemes for taking up storm resilient housing in Danang, a coastal city of Vietnam. The project is managed by Vista and includes ISET, an NGO in Vietnam, Womens' Union of Danang, and Hue University.
- 2015 **The position of India in geopolitics and international trade.**  
*Ministry of Foreign Affairs*  
We analyze the position of India with respect to geopolitics and international trade. The economic and socio-economic developments of recent years are recounted with some emphasis on the heterogeneity of Indian states. On this basis we discuss the geopolitical position of India today, and in the medium term future. Norwegian business interests in India are also categorized.
- 2013 **Analysis and Design of Financial Incentives for Low-Emission Heating Appliances.**  
*The World Bank*  
In the past two years more than 100,000 low-emission household stoves have been distributed in Ulaanbaatar, Mongolia, at very subsidized prices. The subsidies need to be reduced. At the same time the Government of Mongolia would like to scale up access to low-emission stoves and include other cities to the scheme. The project analyses appropriate incentives for these stoves and how they can be scaled up and phased out. Project manager.
- 2011 **Disseminating improved stoves to households in Ulaanbaatar, Mongolia.**  
*The World Bank*  
A large number of highly inefficient household stoves contribute to Ulaanbaatar's serious air pollution problems. The Government of Mongolia and the World Bank aims to disseminate more than 150,000 new stoves over a two-three year period. An important questions is what combination of subsidies and buy-back schemes that will meet this aim. Advisor.
- 2010 **Liberia baseline study.**  
*NORAD*  
Norway is stepping up its assistance to improve electricity coverage in Liberia. For evaluation purposes it is important to benchmark the situation prior to program initiation. This includes, but is not limited to data necessary for an ex post cost benefit evaluation.
- 2009 **The role of developing countries in technology development and transfer**  
*TERI*  
Technology development and transfer, in the context of the UNFCCC, has so far been focusing on the role of developed countries. This project however asks what is the role of developing countries in technology development and transfer.
- 2009 **Incentivizing energy transitions in India**  
*TERI*

## CV Haakon Vennemo

A project to provide advice on incentives for energy transition in India in the areas of lightning, consumer electronics etc. Project Manager.

- 2009            **India 2020**  
*Norwegian Ministry of Foreign Affairs*  
India is facing huge opportunities as well as difficult challenges. At the onset of the Indian election 2009 we take stock of opportunities and challenges, and develop three scenarios for India in 2020 along economic, social, environmental/energy and security dimensions. The scenarios are meant to inform Norway's strategy for cooperation and trade with India. Project Manager.
- 2008-2009    **Co-benefits in India.**  
*Ministry of Foreign Affairs*  
We take stock of present knowledge about co-benefits in India. Some research has been done on the topic, but there are large gaps. The project includes a research report and a workshop assembling Indian and Norwegian researchers. Project manager.
- 2006-2009    **Power sector investment costs in Africa.**  
*World Bank.*  
A study to determine power sector demand and least cost expansion plans considering rehabilitation, new generation, transmission and distribution, trade and no-trade, in 42 African countries. Project manager.
- 2006            **Concept paper on energy security in Africa.**  
*OECD.*  
A paper was developed for Africa Summit of G8 countries in Moscow, October 06. The paper discusses motivation for, and preconditions for meeting electricity investment needs in Sub-Saharan Africa. A partnership to develop energy supply and energy security puts demands on donor countries and recipient countries alike.
- 2006            **Cross-border energy trade and the poor.**  
*UNDP.*  
A study to estimate the linkages between trade in energy goods and energy services on the one hand, and poverty. Quality controller of whole project, and executive responsibility for China case study, involving a model-based macroeconomic analysis and a field study from a Shanxi Province coal city.
- 2004-2005    **Public Expenditure Review in the rural space.**  
*The World Bank.*  
A study examining whether or not public expenditures towards rural regions and the agricultural sector in Mozambique have an appropriate design and reach the poor to a sufficient degree. A household survey in rural areas focusing agricultural extension services is central to the study.
- 2000-2005    **Feasibility study for a Cuban power plant based on sugar residues (bagasse)**  
*UNDP and Cuban Ministry for Sugar (MINAZ).*

## CV Haakon Vennemo

A project to develop a feasibility study of a power plant using the so-called BIG-GTCC gasification technology for biomass combustion. This is the most energy efficient technology currently available. The 17 MW plant is planned for construction in Las Tunas Province of Cuba. Project manager.

2002 **Poverty and environment – proceedings from a workshop.**

*Ministry of Foreign Affairs.*

Arranging program and taking notes from an international workshop on behalf of UNEP, sponsored by the Ministry of Foreign Affairs, to discuss the linkages between poverty and environment. Project manager.

1998 **Assessing MACMOD – a macromodel for Tanzania.**

*NORAD.*

1993-1994 **Structural adjustment and deforestation in Nicaragua.**

*Norwegian Research Council.*

### REFEREE JOURNAL PUBLICATIONS

2014 “Macroeconomic impacts of carbon capture and storage in China”. *Environmental and Resource Economics*, Vol. **59**, 455-477. (With He Jianwu and Li Shantong)

2013 “Upgrading to cleaner household stoves and reducing chronic obstructive pulmonary disease among women in rural China – a cost-benefit analysis”, *Energy for Sustainable Development*, Vol. **17**, 5, 489-496. (With Kristin Aunan, Line W.H. Alnes, Janne Berger, Zeqin Dong, Liying Ma, Heidi E.S. Mestl, Shuxiao Wang and Wei Zhang).

2012 “Air pollution reduction during China’s 11th Five-Year Plan period—local implementation and achievements in Shanxi province”, *Environmental Development*, Vol. **4**, 36-53. (With Daisheng Zhang, Kristin Aunan, Hans Martin Seip, Thorjorn Larssen, Haakon Vennemo, Steinar Larssen, Liulei Feng, Caixia Wu and Ruikai Xie)

2012 “The cost of providing electricity to Africa”, *Energy Economics*, Vol. **34**, 1318-1328. (With Orvika Rosnes).

2011 “The energy intensity target in China’s 11<sup>th</sup> five-year plan period – local implementation and achievements in Shanxi Province”, *Energy Policy*, Vol. **39**, Iss. 7, 4115-4124. (With Daisheng Zhang, Kristin Aunan and Hans Martin Seip)

2009 “Benefits and costs to China of three different climate treaties”, *Resource and Energy Economics*, 31:139-160. (With Kristin Aunan, He Jianwu, Hu Tao, Li Shantong).

2009 “Environmental pollution in China: Status and trends”, *Review of Environmental Economics and Policy*, Vol. **3**, 2:209-230. (With Kristin Aunan, Henrik Lindhjem, Hans Martin Seip).

2008 “Environmental implications of China’s WTO accession”, *Ecological Economics*, 64:893-911. (With Kristin Aunan, He Jianwu, Hu Tao, Li Shantong and Kristin Rypdal).

## CV Haakon Vennemo

- 2007 "Environmental impact assessment in China: Problems and prospects", *Environmental Impact Review*, 27:1-25. (With Henrik Lindhjem, Hu Tao, Ma Zhong, John Magne Skjelvik, Song Guojun, Wu Jian and Zhang Shiqui.)
- 2007 "A portfolio approach to environmental investments: CAPM and endogenous risk", *Environmental and Resource Economics*, 37:681-695. (With Maria Sandsmark).
- 2007 "Benefits and costs to China of a climate policy", *Environment and Development Economics*, 12: 471-497. (With Kristin Aunan, Terje Berntsen, David O'Connor, Therese Hindman Persson and Fan Zhai).
- 2006 "Climate change and air policy – measures with co-benefits in China", *Environmental Science and Technology*, Vol. 40, 16:4822-4829. (With Kristin Aunan, Fang Jinghua, Hu Tao and Hans Martin Seip).
- 2006 "Domestic environmental benefits of China's energy related CDM potential", *Climatic Change*, 75, 1-2:215-239. (With Kristin Aunan, Fang Jinghua, Pernille Høltedahl, Hu Tao and Hans Martin Seip)
- 2005 "Cleaner production as climate investment – integrated assessment in Taiyuan City, China", *Journal of Cleaner Production*, 13, 57-70. (with Heidi E. Staff Mestl, Kristin Aunan, Fang Jinghua, Hans Martin Seip and John Magne Skjelvik)
- 2004 "Co-benefits of climate policy – lessons learned from a study in Shanxi, China", *Energy Policy*, Vol. 32, 4:567-581 (with Kristin Aunan, Jinghua Fang, Kenneth Oye and Hans Martin Seip)
- 2003 "Co-benefits of CO<sub>2</sub>-reducing policies in China - a matter of scale?" *Global Environmental Issues*, Vol. 3, 3:287-305. (With Kristin Aunan, Jinghua Fang, Heidi E. Staff Mestl, David O'Connor, Hans Martin Seip and Fan Zhai.)
- 2002 "A proposed industrial boiler efficiency program in Shanxi; potential CO<sub>2</sub> mitigation, health benefits and associated costs", *Applied Energy*, Vol. 71, 4: 275-285 (with Jinghua Fang, Guanghai Li, Kristin Aunan, Hans Martin Seip, Kenneth Oye and Janos M Beer)
- 2001 "Mitigating GHGs in Developing Countries". *Science*, 293, 23 (with Hans Martin Seip, Kristin Aunan og Jinghua. Fang)
- 2001 "The environmental cost of water pollution in Chongqing, China". *Environment and Development Economics*, 6:313-333. (With Chang Yongguan and Hans Martin Seip)
- 2001 "Environmental regulation of a power investment in an international market" *Resource and Energy Economics* 23 (With Arve Halseth)
- 1998 «Environmental drag: Evidence from Norway.» *Ecological Economics* 30. (With Annegrete Bruvoll and Solveig Glomsrød)

## CV Haakon Vennemo

- 1998 "Structural adjustment and deforestation in Nicaragua" *Environment and Development Economics* 4. (With Solveig Glomsrød and Dolores Monge A.)
- 1997 "An applied general equilibrium model with environmental feedback" *Economic Modelling* 14, 1.
- 1996 "The marginal cost of funds in the presence of environmental externalities" *The Scandinavian Journal of Economics* 98, 3. (With Anne Brendemoen)
- 1995 "A General Equilibrium Assessment of a Suggested Reform in Capital Taxation" *Journal of Policy Modelling* 17, 6. (With Erling Holmøy).
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### RESEARCH AND PUBLICATIONS

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- 2015 Special policy study report: Eco-environmental risk management. Prepared for CCICED Annual Meeting, November. (With other Chinese and international team members).
- 2015 Hvordan ta hele NOREG i bruk. Ny modell for økonomisk utvikling i regionene. (How to make use of NOREG. New model for regional economic development). *Samfunnsøkonomen*, 6, 8-20.
- 2015 Book review of The globalization of clean energy technology – lessons from China. In *The Economics of Energy and Environmental Policy*.
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- 2012 Miljøskadelige subsidier (Environmentally harmful subsidies), *Samfunnsøkonomen*, 1, 22-28. (With Annegrete Bruvoll and John M. Skjelvik).
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- 2009 Nytte og kostnader av klimatiltak under usikkerhet (Costs and benefits of climate interventions under uncertainty), *Research Report 2009-074*, Econ Pöyry. (With Åsmund Jenssen)
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- 2007 *International experiences with environmental and economic accounting.* The World Bank and the Government of PR China. <http://siteresources.worldbank.org/INTEAPREGTOPENVIRONMENT/Resources/GreenaccountinginternationalexperienceFinalEN.pdf>
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- 2003 Så skatten passer – en kommentar til Skaugeutvalget (Fitting taxes, a comment to "Skaugeutvalget"), *Økonomisk forum*, 3, 2003. (With Rolf Røtnes).
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- 1997 "Er økonomer helt som andre?" (Are economists quite like others?). *Mimeo, ECON Analysis*
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- 1992 "Five studies of tax policy using applied general equilibrium models" *Dissertations in Economics 10, Institute of Economics, University of Oslo*
- 1992 "Hvordan ta hensyn til husholdningenes størrelse og sammensetning i fordelingsstudier". (How to account for the size and composition of households when analysing the distribution of income). *Lecture on a predetermined topic required for the Ph.D. at the University of Oslo, March 17*
- 1991 "Økt barnetrygd eller redusert moms på mat?" (Higher child allowance or lower VAT?). *Sosialøkonomen* 9. (With Nina Jentoft)
- 1991 "Er egentlig veiinvesteringer på Østlandet så lønnsomt?" (Are investments in roads in Eastern Norway really that profitable?). *Sosialøkonomen* 6. (With Bjart Holtsmark and Gunnar Sander)
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- 1991 "The marginal cost of public funds: A comment on the literature" *Discussion paper 63, Statistics Norway*
- 1991 "An applied general equilibrium assessment of the marginal cost of public funds in Norway" *Discussion paper 62, Statistics Norway*
- 1990 "Optimal taxation in applied general equilibrium models adopting the Armington assumption" *Discussion paper 55, Statistics Norway*
- 1988 "Anvendelser av generelle likevektsmodeller på skatteøkonomiske problemstillinger". (General equilibrium models applied to tax policy.) *In Vidar Christiansen (ed.): Rapport fra seminar om skatteøkonomisk forskning. (Report from a conference on economic research on taxation.) Economic Research Programme on Taxation Report*
- 1987 "MSG 4 - A complete documentation of the system of equations" *Reports 87/14, Statistics Norway*. (With Erik Offerdal and Knut Thonstad)

### OTHER QUALIFICATIONS

- 2016- Member of a government commission to deliver an NOU to modify the legal framework for docks and ports
- 2009-2010 Member of government commission delivering NOU 2010:20 Tilpassing til eit klima i endring (adapting to a changing climate).
- 2000- Referee *Norwegian Research Council*
- 1993- Referee *Climate Policy, Ecological Economics, Energy Journal, Environment and Development Economics, Environmental and Resource Economics, Environmental Science and Technology, International Tax and Public Finance, Regional Science and Urban Economics, Resource and Energy Economics, Samfunnsøkonomen, Scandinavian Journal of Economics, Norsk Økonomisk Tidsskrift.*

## CV Haakon Vennemo

- 2014 Member, committee to award the best Master's Thesis in Economics, University of Oslo
- 1990- Co-editor, *Nordic Journal of Political Economy*
- 2012- Member of editorial board, *Journal of Environmental Economics and Policy* (Chinese language journal)
- 1990- Master thesis advisor, University of Oslo
- 1986- External examiner, undergraduate and graduate level, University of Oslo, University of Life Sciences
- 2007-2009 Op-ed commentator, Stavanger Aftenblad ([www.aftenbladet.no](http://www.aftenbladet.no)).
- 2006-2009 PhD thesis advisor, University of Oslo
- 2004, 2012 Referee *MIT Press*
- 1993-94 Lecturer, graduate courses in Macroeconomics, University of Oslo
- 1992-1993 Member of government commission delivering NOU 1993: 8 Bør momsen differensieres (Should the VAT be differentiated?)
- 1984-89 Teacher and Student Assistant, undergraduate level, University of Oslo
- 1988-91 Journalist and member of the editorial staff, «Natur og Miljø», the magazine of the Norwegian Society for Conservation of Nature (circulation ca. 45 000)