The Economics and Politics of Phasing Down Fossil Fuel Production

Workshop summary

Online workshop

Tuesday November 3

13.00-16.30 CET

Hosted by Wageningen University, the Netherlands

Team of organisers:

Edwin van der Werf (Environmental Economics and Natural Resources Group, Wageningen University)

Stephan Slingerland (SPA Sustainability and IVM/Vrije Universiteit Amsterdam)

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To meet the international climate goals of the 2015 Paris Agreement, most fossil fuel reserves will have to remain in the ground (McGlade and Ekins, 2015). As existing policies are mainly aimed at the demand for fossil fuels, novel policies could be aimed at reducing their supply. Currently, at least two strands of literature are developing on this issue. One is rooted in economics and uses mathematical models to assess the conditions under which owners of resource stocks may be persuaded in an efficient way not to exploit their fossil fuel reserves (e.g. Harstad, 2012; Asheim et al., 2019). A second branch is rooted in the field of international relations and international law and uses a descriptive-normative approach and case studies on related issues (e.g. a Fossil Fuel Non-Proliferation Treaty) to study the opportunities and distributional issues of phasing down fossil fuel extraction (e.g. Lazarus and Van Asselt, 2018; Muttitt and Kartha, 2020).

In order to find concrete and actionable options for a coordinated approach to phasing down fossil fuel production in line with the Paris Agreement's goals, with an acceptable level and distribution of monetary and non-monetary costs, these strands of research should be brought together. The objectives of this online workshop, hosted by Wageningen University, are (1) to bring together scholars from various fields and learn from their disciplinary insights, (2) to gain insights from stakeholders into the barriers and incentives in practice, and (3) to generate multidisciplinary insights on the topic of phasing down fossil fuel production.

International cooperation on supply-side initiatives is relevant because (1) it reinforces the Paris agreement, (2) it avoids carbon lock-in and stranded assets and nations by avoiding continued investment in fossil fuel infrastructure, and (3) it allows to plan for a just transition away from fossil fuels. Participants in an international collaboration could be (1) first-mover countries that already have (announced) moratoria on exploration or extraction or both (e.g. Costa Rica, Belize, Germany) and they can put moral weight on the issue (although they typically have few resources themselves), (2) countries at risk of climate impacts (such as small-island developing states), (3) major fossil fuel producers (which will be very difficult, but some examples exist, like Norway, who wants to reduce fossil fuel subsidies), and (4) countries in the global North (that act out of equity and moral motivations). Co-operations could include both state, non-state and subnational actors, and could signal the phasing out of fossil fuel infrastructure (see e.g. Powering Past Coal Alliance).

Which forum should be used to address international cooperation in regards to phasing down fossil fuels? Some possible forums are: The UNFCCC (where a just transition away from fossil fuels is rising on the agenda), the UN environment program, G20, OECD and IEA. However, maybe a new forum is needed to allow moving away from the existing political problems of existing forums. The legal spectrum of international agreements includes (legally binding) treaties, political declarations, and memorandum of understanding. A treaty can signals credibility of commitment, and maybe enforceable in domestic legal order, but is harder to negotiate, and non-state actors or sub-national actors are generally not included. What can be specified in the arrangements? The first question is about the scope of agreement: Should it focus on new or existing FF infrastructure? Should it specifically target one fuel or all? Should it focus on specific areas, such as the Arctic, or areas with high biodiversity value? The second question is about substantive versus procedural commitments. Substantive commitments could be about no new FF infrastructure, phase-out existing infrastructure, plan on a just transition away from fossil fuels, and a phase-out of financial support. Procedural obligations could be about transparency (see e.g. Richard Folland's pitch later this workshop) through reports on reserves, production plans, policies, measures, financial support, etc.

For any international agreement to be effective, it has to be equitable as well. We can identify some basic equity principles such as alignment of an international supply-side agreement with the Paris goals, enable a just transition for workers and communities, and share costs fairly. Another important principle is to reduce extraction fastest where it entails the least social costs, for example countries that can absorb rapid depreciation of sunk costs or have few resources in the first place. See also Muttitt & Kartha (2020) on

equity principles in the context of phasing down fossil fuel production. One could introduce exceptions, grace periods and financial support as a means to make international agreements more equitable.

The second branch of literature focuses on the economics of supply-side policies. Carbon leakage occurs when emission abatement due to stricter climate policy in one country is partly offset due to an increase in emissions in another country, for example due to a lower world price for fossil fuels. Carbon leakage occurs both through demand and supply polices, but is minimized when combined. The steeper the supply curve, the more efficient it is to focus on regulating supply. We can exploit this fact by using a counter-intuitive policy option, which is to buy up coal reserves for conservation. An efficient supply-side policy is to set aside reserves that have profit lower than environmental damages. This would lead to a part of the supply curve to shift upwards, and be locally inelastic. This reduces carbon leakage and makes domestic supply-side policy more efficient.

Expectations about future policies matter for supply-side policies: expected future conservations, makes conservation today more attractive. For example, if the current government expects the next government to extract, then it should extract the fossil fuels, to consume the rents themselves. However, if the current government expects future governments to conserve, then it will conserve the fossil fuels as well, and leave them underground. The opposite multiplier can be seen for lobbying for extraction. It is therefore optimal for the climate coalition to credibly commit from the beginning that fossil fuel producers will be compensated in the future. For example via the creation of an independent fund that pays in the future.

A supply-side climate treaty has some advantages compared to a demand-side climate treaty. Fewer parties are involved, so in principle it should be simpler to enforce. Moreover, it can function as an insurance policy in case the demand-side policy (the Paris agreement) fails. Supply-side policies are also complementary to demand-side policies: the temptation to free ride is reduced and the temptation to emit more than promised is reduced, because non-coalition countries cannot benefit from low prices anymore. An interesting candidate for a supply-side agreement is a moratorium on exploration and extraction in the Artic. Fossil fuels in that region are costly to extract, and there are still many factors that are unknown (such as endowments, necessary technologies, or property rights). The fact that these factors are largely unknown, makes it easier as well for countries to agree on a moratorium now, rather than in the future.

The similarities of the international law and economics perspectives are that both are aimed at changing the actions of actors. Important differences are about the underlying assumptions about their motivations and behavior: can we assume that all actors base decisions on economic incentives. Important questions are how equity can be formalized to make it more actionable, and what is the role of non-state actors?

In the subsequent discussions, several points were raised. In the US, domestic politics will influence international agreements. Biden can focus on federal lands, so limiting drilling on federal land or the artic. There is also action at the subnational level, such as California which is moving towards the supply side. An important remark is to make sure that people involved in the industry are going to be better off during and after the transition: a *managed* decline of the industry. Joint moratorium on artic oil and gas is part of Biden's climate plan. As to why a supply side climate treaty would not fail for the same reason as Paris, it is important to realise that there are fewer actors, so a supply side agreement will be easier to agree and monitor. Demand and supply-side treaties are complementary due to counter-acting effects on prices. For cost-effectiveness and climate impacts the focus could be in coal. Countries should start with not building coal-fired power plants. Not all actors are acting rationally, and there are also other factors that influence the decisions. Many decisions are politically driven. Still, producing while making a loss might make economic sense: when infrastructure costs are high (sunk costs) and the extraction are actually not profitable (price lower than average costs), extraction makes economic sense as long as price is higher than marginal costs.

A rule designer could start with a small club with countries that are passionate and includes non-state actors. Start small, but with ambitious and binding pledges, and then start growing. In terms of the form, it would exist outside of the current forms. It could be designed like OPEC with a focus on reducing supply, or even similar to the EU ETS, a global cap on fossil fuel extraction and a tradable permit system for extraction.

NGOs see that fossil fuels were already showing signs of decline before the COVD-19 crisis. This crisis has already shown the different impacts: High income countries can subsidize the industry, while countries like Angola or Nigeria cannot support the industry during this crisis. Moreover, energy stocks lost 60% more than the S&P 500 Index, which is the biggest drop in any sector since 1928. Investments in renewable energy generate three times more jobs than investment in fossil fuels. Furthermore, a survey in the UK found that oil and gas workers are open to switch to other sectors. Renewables outcompete fossil fuels on costs. Because of these reasons and many more, it seems that this is the right time to phase out fossil fuels. We already see some countries such as Costa Rica, Belize, France, etc. start implementing supply-side climate policies. Even though an international treaty might be preferable, international action on FF is extremely difficult, and so a different approach is to start by a first-movers club. It is important to avoid stranded assets (so no investments in fossil infrastructure from covid-19 recovery funds) and focus on a managed decline and a just transition. Principles of an equitable phase out could be based on countries' dependency on fossil fuels and their capacity to reduce.

From the perspective of climate diplomacy, there are various policy options, both on the demand-side and on the supply-side. They work in parallel. The International Energy Agency (IEA) does not believe in bringing down fossil fuel production as it brings the risk of shortages and economic crisis. The IEA puts a lot of emphasis on energy efficiency, the promotion of electric vehicles and renewable energy. But supply-side policies can increase the price of fossil fuels, which makes it more attractive to move consumption away from fossil fuels. One instrument in the policy maker's tool box for the road towards a reduction of supply is reform of fossil fuel subsidies. This has been on the agenda of the G20 but nothing is moving. In the Netherlands foreign trade and investment instruments have been reformed, with financial support for fossil fuel exploration and development being phased out, and no support for coal. Another tool is international climate agreements, but these typically do not work. Such agreements should have a specific and tailored design and will often have to be accompanied by other policy measures. The EU also has various policy instruments such as regulation, a carbon price, border carbon adjustments and incentives for renewables. These instruments could go beyond the EU's borders. Thematic coalitions are another potential tool. Good examples are the Powering Past Coal Alliance, and OPEC: what can we learn from them? A final tool is moral power, which is used by UN Secretary General António Guterres and (very effectively) by Greta Thunberg who effectively mobilises millions of young people across the globe, who in turn use their own individual power as consumers, voters and influencers.

Climate diplomats can play an important role by consistently zooming out for the bigger picture and keeping the overarching objectives center stage, by connecting different stakeholders and creating mutual understanding and facilitating learning, by guiding multilateral organizations, international institutions, governments and businesses, and by defusing difficult issues, prevent crisis situations. To do this effectively it is important to distinguish between different types of countries: traditional production countries (esp. OPEC) with low climate ambition; developed countries (sometimes producers, like NL, Norway) with high climate ambition; developing countries with high dependency of OPEC (India, Indonesia) and developing countries with own (newly discovered) supply (Mozambique, Surinam). These different interests can lead to tensions in settings like the G20. More research is needed on the underlying dependencies, interests and capacities of the different types of countries. A Chatham House report argues that lower-income countries that are banking on their fossil fuels lack the capacity to assess carbon risks and may be left behind by shifts in investment and credit.

Some ideas that could be explored are to further develop the idea of strategic autonomy in EU energy policy; the creation of a new 'cartel' as a counterweight to OPEC (a 'club approach', cf. ideas of William Nordhaus); a green recovery and building back better; creating a level playing field between fossil and renewables, ultimately tipping over to renewables; reinvent (climate and economic) diplomacy that moves away from focusing on a global conference and agreement but rather the creation of new coalitions and clubs, connecting different stakeholders. Ultimately, a balance between supply-side and demand-side options will need to be found, which requires both academics and policy makers.

Two additional points that were raised in the discussion were, first, the importance of political economy. This offers a good explanation for energy policies. Russia is moving in the climate arena and the turmoil of

the fossil fuel market. Second, there could be a need to focus on large emitters, which in the future are in Asia and Africa. There is a need to pay (compensate) producers and governments in developing countries to leap-frog the fossil economy. Note that it is often firms who own the resources and need compensation, not governments.

Two relevant additional issues are distribution and conflicts. Distributional issues affect political feasibility. Demand-side policies hurt suppliers, so for them supply-side policies might be better and perhaps even better than no climate policies, if prices rise sufficiently. Conflicts may occur between fossil fuel importing and exporting countries, and who gains and who loses will depend on the instruments implemented by the coalition of ambitious countries. Furthermore, if extraction taxes or auctioned extraction permits are used as a supply-side policy instrument, there is a transfer of rents from firms to the government.

Regarding treaty design: a multilateral agreement on phasing down fossil fuels could learn from the nuclear non-proliferation treaty, which was a diplomatic success in times of cold war mistrust: a Fossil Fuel Non-Proliferation Treaty (FFNPT). A FFNPT could have a three pillar structure. First, 'non-proliferation', i.e. preventing the exploitation of new fossil fuel resources. The percentages of each fossil fuel to remain in the ground could be based on models of cost-minimization like McGlade and Ekins (2015) and continuously revised. Reporting and monitoring could be relatively easy as it concerns a relatively small number of large, easily identifiable projects. The second pillar is 'disarmament': the managed and accelerated decline of existing fossil fuel infrastructures, not only by restricting supply but also by restricting demand. The final pillar concerns the promotion of the 'peaceful' use of technology, i.e. support for developing countries for the transition to low-carbon and non-fossil fuel energy and transport. Such a treaty can take many forms, but should start with countries with high ambitions.

A Global Registry of Fossil Fuels could be useful to provide the missing baseline of fossil fuels that are known, estimated and planned for extraction, to be able to assess the emissions these projects lock-in against the trajectory of climate ambition needed to stay within the safe temperature goal of 1.5 degrees Celsius. It can be used by government, investor, insurance, academic and civil society leaders to determine the role countries and fossil fuel companies are playing in exceeding warming beyond the 1.5 degrees Celsius limit, in order to plan for a global, equitable transition to clean, low carbon energy. A Global Registry of Fossil Fuels will offer transparency through standardized, comprehensive, government-vetted, publicly available data on fossil fuels. This will include reporting on fossil fuel reserves, licensed resources and historical and projected future production. It will help make governments accountable for their actions.

In the final discussion and concluding remarks, several points were made. Producers plan for 3-4 degree temperature increase. This runs the risk of becoming a self-fulfilling prophecy. During the last 25 years, coal has increased its fraction (e.g. in China). Therefore, limiting the use of coal is key. We need redistribution among fossil fuel producers. Within an ambitions supply-side club, extraction permits should be tradable (globally). This will solve some of the inefficiency problems. It might be more difficult to do this globally. However, a climate club approach brings the risk of a trade war.

A moratorium on exploration would implement a Hotelling world where we have a fixed stock of fossil fuels and we would then see rising prices. Without a moratorium, as was the case over the last decades, we do not see rising prices due to expansion of stocks. A supply-side approach could start with a moratorium on exploration in the Arctic (win-win-win). Political economy issues and the motives and drivers of agents are important to understand. Moratoria and non-proliferation agreements could be very important for Africa. As the African economies are growing and urbanising, energy demand will grow quickly. It is therefore important to act now to prevent the opening of new mines and wells. Burden-sharing will play a key role.

In research, a multi-disciplinary approach is needed.

Some relevant references:

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Hoel, M. (1994), 'Efficient climate policy in the presence of free riders', *Journal of Environmental Economics and Management* 27, 259-274

Lazarus, M., and H. van Asselt (2018), 'Fossil fuel supply and climate policy: exploring the road less taken', *Climatic Change* 150, 1-13

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Newell, P., and A. Simms (2019), 'Towards a fossil fuel non-proliferation treaty', *Climate Policy* 20(8), 1043-1054

Pye, S., et al. (2020), 'An equitable redistribution of unburnable carbon', *Nature Communications* 11: 3968

Program (all times Central European Time, CET)

13.00-13.15	**Opening**		
13.00-13.05	Welcome	Stephan Slingerland	SPA Sustainability and IVM/Vrije Universiteit Amsterdam
13.05-13.15	Setting the Scene	Edwin van der Werf	Wageningen University
13.15-14.10	**Keynotes I: Scientific insights**		
13.15-13.30	Keynote 1: International Law	Harro van Asselt	University of Eastern Finland
13.30-13.45	Keynote 2: Economics	Bård Harstad	University of Oslo
13.45-13.50	Response	Josephine van Zeben	Wageningen University
13.50-14.15	Discussion	plenary	
14.15-14.25	**Break**		
14.25-15.25	**Keynotes II: Stakeholder perspectives**		
14.25-14.40	Keynote 3: NGO perspective	Laurie van der Burg	Oil Change International
14.40-14.55	Keynote 4: Climate diplomacy	Marcel Beukeboom	Dutch Climate Envoy
14.55-15.00	Response	Hugo Brouwer	Dutch Ministry of Foreign Affairs
15.00-15.25	Discussion	plenary	
15.25-15.45	**Break**		
15.45-16.15	**Viewpoints**		
15.45-15.50	Pitch 1	Karine Nyborg	University of Oslo
15.50-15.55	Discussion	plenary	
15.55-16.00	Pitch 2	Peter Newell	University of Sussex
16.00-16.05	Discussion	plenary	
16.05-16.10	Pitch 3	Richard Folland	Carbon Tracker Initiative
16.10-16.15	Discussion	plenary	
16.15-16.30	**Wrapping up**		
16.15-16.25	Summary of the afternoon	Hans-Peter Weikard	Wageningen University
16.25-16.30	Closing	Stephan Slingerland	SPA Sustainability and IVM/Vrije Universiteit Amsterdam
16.30	**End of workshop**		

Speakers:

Harro van Asselt is a Professor of Climate Law and Policy with the University of Eastern Finland (UEF) Law School, Visiting Research Fellow with Utrecht University's Copernicus Institute of Sustainable Development. He is an expert on interactions between international climate change governance and other fields of international governance. Van Asselt worked at the Stockholm Environment Institute, where he remains an associate. He is the author of The Fragmentation of Global Climate Governance (Edward Elgar 2014), co-editor of Governing Climate Change and The Politics of Fossil Fuel Subsidies and Their Reform (both Cambridge University Press 2018), and he has more than 80 publications in peer-reviewed academic journals and books.

Bård Harstad is Professor in Economics at the University of Oslo. He was the Max McGraw Chair in Management & Environment at Kellogg School of Management, Northwestern University, before he left for Norway in 2012. He has received two ERC Grants, and twice the biannual Erik Kempe Award for the best European paper in the field of environmental and resource economics (2013 and 2019). He is an editor of *Journal of the European Economic Association* and, from 2021, a managing editor of *Review of Economic Studies*.

Laurie van der Burg is a Senior Campaigner at Oil Change International. Her work focuses on ensuring a just transition through moving governments and financial institutions away from continued financing and permitting the expansion of oil and gas. Previously, Laurie worked at Friends of the Earth Netherlands where she led a climate court case against Shell, filed on behalf of over 17000 people. Prior to that she worked with the Overseas Development Institute as a climate and energy researcher focusing on fossil fuel subsidies and energy access and did an internship at the UNFCCC. Laurie holds an LLM in Environmental and Climate Change Law from the University of Edinburgh and a Bsc in Liberal Arts and Sciences from Amsterdam University College.

Josephine van Zeben is Professor and Chair of the LAW group at Wageningen University. She holds a PhD in Law and Economics (cum laude) from the University of Amsterdam, and LLM degrees from Harvard University and the University of Amsterdam (European Private Law), an LLB in Scots Law from the University of Edinburgh and a BA in Social Sciences from University College Utrecht, Utrecht University. Prof. van Zeben's research focusses on the regulation of environmental issues by public and private actors across jurisdictions.

Marcel Beukeboom is Climate Envoy for the Kingdom of the Netherlands. As Ambassador-at-large for Climate, Marcel Beukeboom is the dedicated representative of the Netherlands at international gatherings dealing with climate change. At home he is the figurehead of national climate policy. He connects the global to the local, policy to practice, problem to solution. He has worked on a wide range of topics such as food security, finance, trade, multilateral affairs and development cooperation. He did so in many countries, and was posted in South Africa and the United States. Marcel Beukeboom holds a Masters title in International Relations (University of Groningen) and followed the Practice of Trade Policy Program at Harvard's Kennedy School of Government.

Hugo Brouwer works as Focal Point Energy at the Inclusive Green Growth Department of the Netherlands Ministry of Foreign Affairs. His work focuses on energy diplomacy, including issues related to energy security, the (geopolitics of the) energy transformation, cooperation with international energy organizations and bilateral energy relations with a focus on the MENA-region. Before taking on his current position, Hugo served at the Netherlands diplomatic missions in Iraq, Russia and Ukraine.

Karine Nyborg is Professor of Economics at the University of Oslo. She is Past President of the European Association of Environmental and Resource Economics (President 2012-2013) and Editorial Board member of the *Review of Environmental Economics & Policy*, the *Journal of Environmental Economics & Management* and the *Review of Behavioral Economics*. In 2002 she won the Erik Kempe Award 2002 (biannual prize for best European paper in environmental and resource economics). She has been a member of several Government-appointed expert commissions. Her research interests include environmental economics, behavioural economics, economic analysis of social and moral norms.

Peter Newell is a Professor of International Relations at the University of Sussex. He has worked on issues of climate change and energy for more than 25 years He has worked with a wide range of civil society organisations, research institutes, governments and international institutions and currently sits on the board of directors of Greenpeace UK. His books include *Climate for Change; Governing Climate Change*; *Transnational Climate Change Governance Globalization and the Environment* and *Global Green Politics*.

Richard Folland has been Carbon Tracker's policy and government affairs adviser since 2014. Richard has over 30 years' experience as a diplomat and advocate, operating at the highest level, based in Europe and elsewhere. He has worked on the climate and energy agenda, as a policymaker and as a private sector advisor, for 15 years. A former head of international energy policy at the UK Foreign Office, Richard has also been JPMorgan's European Advisor on Energy and Climate Change, the Executive Director of the Climate Markets and Investment Association (CMIA), and the Head of Energy and Environment at Inline Policy. He was Co-Founder of the strategic advisory firm, Sustineri, working with institutional investors on climate and sustainability issues.

Edwin van der Werf is Associate Professor at the Environmental Economics and Natural Resources Group of Wageningen University. He holds a PhD in Economics from Tilburg University. His research focuses on the economics of climate change mitigation policy, notably ex-post and ex-ante assessments.

Stephan Slingerland is an independent researcher and author in the field of geopolitics and social sustainability transitions. He studied natural and environmental sciences at the universities of Leiden and Cambridge and defended a PhD in social environmental sciences at the University of Amsterdam. He is currently associated with the institute for environmental studies at VU Free University Amsterdam.

Hans-Peter Weikard is Associate Professor of Natural Resource Economics. He received a doctorate from the University of Witten-Herdecke, Germany and a habilitation (venia legendi) from the University of Potsdam. In his research at Wageningen University he applies theoretical and conceptual approaches to various themes in environmental and natural resource economics. A core area of his research is the stability of international environmental agreements using applied game theory. He serves on the editorial boards of *Water Economics and Policy* and of *International Environmental Agreements: Politics, Law & Economics*.

List of participants

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The **Environmental Economics and Natural Resources Group (ENR)** of Wageningen University contributes to the construction of a sustainable and circular economy, and low-carbon, climate resilient social-ecological systems. Its research and education focuses on the economics of energy transitions, climate policy and the cost of action/inaction; human behaviour, technological progress and the role of economic policy instruments in the transition to sustainable and healthy production and consumption; and the economics of resilient and sustainable social-ecological systems

The **Law Group** of Wageningen University focusses on legal solutions to social problems, including those studied in life sciences domains. These issues touch on every aspect of the law, which means that we have collective expertise on matters relating to EU law, food law, international law, WTO law, intellectual property law, private law and human rights law. The research of the group is also strongly interdisciplinary, with faculty and students from all over the world.

The **Environmental Economics and Natural Resources Group (ENR)** and the **Law Group (LAW)** are both part of the **Department of Social Sciences of Wageningen University**.