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## Energy and Taxation

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*Published in:*  
A Force of Energy

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2022

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Burgers, I. (2022). Energy and Taxation: U.S. lessons for Carbon Capture and Storage in Europe. In R. Fleming, K. de Graaf, L. Hancher, & E. Woerdman (Eds.), *A Force of Energy: Essays in Energy Law in Honour of Professor Martha Roggenkamp* (pp. 112-121). University of Groningen Press.

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# ENERGY AND TAXATION: U.S.-LESSONS FOR CARBON CAPTURE AND STORAGE IN EUROPE

Irene Burgers<sup>1</sup>

Abstract

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Energy and taxation is a rich field for research and its societal relevance is high. In this Chapter I provide an overview of the research I did in this field, made enthusiastic on this topic by Martha Roggenkamp. Next, I provide an update of the research my colleague Jan Bouwman and I have done on the question whether tax law will act as a barrier or as a tool for promoting CCS for a project initiated by Martha Roggenkamp and Edwin Woerdman on the capture, transportation and permanent storage of CO<sub>2</sub>. I conclude that the EU would do well by taking the U.S. experience as example, using a tax credit as a tool for incentivizing investment in carbon capture and sequestration.

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## 1 Introduction

My interest in energy as a subject of study dates back to the mid-seventies of the previous century, when – at the age of 15 – I wrote a thesis for a high school subject “Civil education” on the advantages and disadvantages of wind energy, solar energy and nuclear energy.

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However, the interest remained latent until I met Martha Roggenkamp in 2005, the year she was appointed as professor in Energy Law. At the time my field of research concentrated on tax treaties to prevent double taxation and tax avoidance, on harmonization of corporate income tax in the European Union and on non-discrimination issues. I had no idea of the richness of the field of studies that concerns tax issues related to energy. I was basically only aware of the tax issues related to the exploration and exploitation of the continental shelf and the existence of environmental charges.

Martha's enthusiasm and initiatives made my latent interest become active in 2007. Ever since that time, I have supervised several theses and spent part of my research time on tax issues concerning energy and taxation.

## 2 Research in relation to energy and taxation

Research in the field of taxation and energy is of societal relevance due to:

- the climate crisis; and
- societal benefits from resource extraction.

First, taxation may be used as an instrument to stimulate clean energy and/or reduce the use of energy<sup>2</sup>. Second, governments may want to control behavior of investors not only through legislation, but also through financial charges such as a return for the extracted petroleum or mineral<sup>3</sup>, and a tax on the profit derived by the investor. Therefore, they need to draft a tax and/or broader fiscal system<sup>4</sup> applying to the extractive industries in such way that it ensures that the government obtains an adequate and appropriate share

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2 I.J.J. Burgers, *Energiebelastingen: Europa's luchtverfrisser of melkkoe*, NTFR 2011/1645; I.J.J.

Burgers, *Altijd ergens en de vervuiler betaalt genoeg?*, NTFR 2016/2594.

3 The United Nations 2017 Handbook (footnote 4) expresses: "The tax and broader fiscal system that applies to the extractive industries should ensure that the government obtains an adequate and appropriate share of the benefits from its resources—taking into account that extractives are assets owned by the country and once extracted, they are gone—while providing a return commensurate with the risks borne and functions carried out by the parties".

4 The terminology "tax and broader fiscal system" is used for the following reason. Historically, rights in oil were granted by means of "concessions" which authorized a company to explore, develop and market petroleum for a specified number of years. The investor – generally a foreign company – is the sole decision maker and bears all the costs and risks of developing the field and exercises ownership rights in the extracted minerals. In return, the foreign company agrees to pay the host government production-based royalties or a combination of royalties and taxes. Regimes that countries presently use for taking a fiscal charge are "tax and royalty regimes" based on public law.

of the benefits from these resources, being assets owned by the country and once extracted, they are gone<sup>5</sup>. Redrafting such legislation may be needed for diverging reasons<sup>6</sup>. There is a wide variety in legal instruments for charging upstream petroleum (oil and gas) and mineral activities. The existing legislation may fit no longer with the present conditions.

I analyzed the Energy Tax Directive 2003/96, legal aspects of the design of a carbon tax (including state aid issues) and – to prevent double taxation – a carbon adjustment tax<sup>7</sup>. I also wrote about issues on preventing double taxation in case of onshore or offshore exploration and exploitation of oil and gas<sup>8</sup>. With two PhD-students, I have been working on instruments regulating the extractive industries through financial instruments. Private law instruments include, amongst others, concessions, production sharing contracts and risk service contracts<sup>9</sup>. Public law instruments include petroleum licenses, a special petroleum tax (levied amongst others by Malaysia and the UK) and a non-tax financial obligation requiring the investor to share its profits with the government by virtue of legislation instead of a contract such as the State's Profit Share (*staatswinstaandeel*) levied by the Netherlands. Which instrument a state uses depends both

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- 5 Examples of regimes used at the time of writing are: 1. Tax regimes such as the UK's petroleum revenue tax and Malaysia's petroleum income tax; 2. non-tax financial obligations such as the State's Profit Share (*staatswinstaandeel*), surface rental and "cijns" on the holder of a license to explore and/or exploit on its turnover, being the number of units of mineral oil or natural gas produced in the licence area and accruing to the holder levied by the Netherlands, and 3. contract regimes based on private law (production sharing contracts or agreements (e.g. used in e.g. Indonesia, Tanzania and Uganda) and risk sharing contracts (e.g. Azerbaijan).
  - 6 For instance, the current system may not provide sufficient certainty for investors. First, the system may not be sufficiently transparent, which is the case if the fiscal charge is regulated by way of production sharing contracts, an instrument often used by developing countries. Second, double taxation may not be (sufficiently) prevented, due to insufficient regulation by means of tax treaties. Third, advancement of new technology makes previously unextractable oil extractable for instance in the deep sea. This might create legislative uncertainty. The International Seabed Authority is working on a new Mining Code, but at the time of writing (December 2021) this new Code has not been adopted. <https://www.isa.org/jm/mining-code>.
  - 7 Irene Burgers, Stefan E. Weishaar, *Designing Carbon Taxes Is Not an Easy Task* (WIFO Working Papers 559, 2018). See also: Claudia Kettner, Daniela Kletzan-Slamanig, Stefan E. Weishaar and Irene J.J. Burgers, 'Designing Carbon Taxes: Economic and Legal Considerations', in Marta Villar Ezcurra, Janet E. Milne, Hope Ashiabor and Mikael Skou Andersen (eds.), *Environmental Fiscal Challenges for Cities and Transport* (Edward Elgar, 2019), pp. 213 – 225.
  - 8 I.J.J. Burgers, *The Taxation of Permanent Establishments The Netherlands* par. 8.4 Oil and Gas Industry; in I.J.J. Burgers and G. Gallo, *Permanent Establishments*, IBFD, online publication.
  - 9 For details on these private law instruments, see *United Nations Handbook on Selected Issues for Taxation of the Extractive Industries by Developing Countries* (New York, 2017), pp. 23 – 25.

on legal culture<sup>10</sup> and economic reasons, and thus the instruments used change from time to time<sup>11</sup>.

### 3 Carbon capture and storage and tax law

In 2007 Martha Roggenkamp and Edwin Woerdman initiated the Groningen Centre of Energy Law – nowadays called Groningen Centre of Energy Law and Sustainability – as well as a mutual research project. Sixteen researchers of the Faculty of Law of the University of Groningen who had joined the center analyzed legal issues and policy questions concerning the capture, transportation and permanent storage of CO<sub>2</sub> (referred to as ‘CCS’). The results were published by Intersentia in 2009<sup>12</sup>. My colleague Jan Bouwman and I answered the question whether tax law will act as a barrier or as a tool for promoting CCS. We concluded that, in the Netherlands, CCS activities have tax implications for wage taxes, value added tax, corporate income tax, property tax levied by municipalities<sup>13</sup>, transfer tax and environmental taxes. We also found that none of these taxes contain special regimes for CCS and that the Directive 2009/31/EC on the geological storage of carbon dioxide does not give reference to financial conditions, including tax, concerning CCS.

In their concluding chapter, Martha and Edwin summarized the findings of the group by formulating questions concerning the legal framework for CCS. In respect of tax, they highlighted uncertainty concerning tax treatment of CCS for property tax purposes and the finding that general tax incentives, such as for wage tax purposes the (*WBSO*) R&D-tax credit, are usually more effective than subsidies. The reason being that private firms remain more autonomous in their decisions; are less subject to bureaucracy and uncertainty connected to direct subsidies; and tax credits do not have the welfare-economic disadvantages of subsidies.

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10 See for a legal culture analysis of the character of petroleum licenses M.M. Roggenkamp, Oil and gas licenses – a legal nature perspective: the Netherlands,’ in T. Soliman Hunter, J. Oyrehagen Sunde & E. Nordtveit (eds.) (, The character of petroleum licenses: A legal culture analysis, Edward Elgar, 2020, pp. 139-158.

11 For an overview of economic considerations see United Nations Handbook on Selected Issues for Taxation of the Extractive Industries by Developing Countries, New York, 2017, p. 237.

12 Martha M. Roggenkamp and Edwin Woerdman, *Legal Design of Carbon Capture and Storage Developments in the Netherlands from an International and EU Perspective* (Intersentia, 2009).

13 In the Netherlands property taxes have been levied only by municipalities (*onroerende zaakbelasting*) since 2001.

In 2020 Martha explored the recent developments in the field of carbon capture and storage in the Netherlands from a legal perspective and concluded that this is a long and winding process. Following opposition to carbon capture and storage onshore, the offshore demonstration projects were not successful amongst others due to lack of finance. Martha observed that due to the increasing price of emissions allowances this may change in the future. Carbon Capture and Storage (CCS) and Carbon Capture Use and Storage (CCUS) may become an essential part of governments policies. Governmental financial support, such as the Dutch national support scheme “*Stimuleren Duurzame Productie*” (SDE++), was initially intended to provide support to renewable energy, but has been changed so that as of 2020 support may be granted to other climate-friendly techniques, including CCS and CCUS, which may be an incentive for investment in these techniques<sup>14</sup>. The European Commission approved of the scheme under state aid rules on 14 December 2020<sup>15</sup>.

Below I will briefly elaborate on some interesting developments in respect of tax incentives for Carbon Capture and Storage in the EU as of 2011 and of the US as of 2008.

In 2011 the European Commission – without success – proposed to amend the Energy Tax Directive to support the objective of moving to a low-carbon and energy-efficient economy by:

- splitting the tax rate into two components: one based on CO<sub>2</sub> content and the other based on energy content;
- introducing a single minimum rate for CO<sub>2</sub> emissions (20 €/t CO<sub>2</sub>) for all sectors not covered by the EU ETS based on the energy content of a fuel (€/GJ) rather than the volume; and
- exempting recoverable energy<sup>16</sup>.

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14 M.M. Roggenkamp, ‘Carbon Capture and Storage in the Netherlands: A Long and Winding Process’, in Roggenkamp, M. M. & Banet, C. (eds.). *European Energy Law Report* (Intersentia, 2020), pp. 405-417.

15 European Commission 14 December 2020, State Aid: European Commission approved € 30 billion Dutch scheme to support projects reducing greenhouse gas emission, [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_2410](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2410)

16 Proposal for a COUNCIL DIRECTIVE amending Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity COM(2011) 169 final.

In this proposal no reference was made to carbon capture and storage.

However, as evidenced by a January 2015 report written at the request of the European Commission by Triple, Ricardo-AEA and TNO, the European Commission did prove to be interested in carbon capture and storage. The European Commission asked these three advisory firms to make an evaluation of the Carbon Capture and Storage (CCS) Directive (2009/31/EC), as well as recommendations for the future of the CCS Directive, and wider CCS-enabling policy for the Commission to consider<sup>17</sup>. The CCS Directive focuses on the health, safety, and environmental risk aspects of CCS, particularly transport and storage. The authors concluded that the overall need for CCS (and European CCS regulation) to decarbonize power production and heavy industry in Europe (in line with the 2050 emission reduction targets) remains genuine and urgent, but that given the lack of practical experience it would – at the time – not be appropriate, and could be counterproductive, to reopen the Directive for significant changes. The authors explicitly mentioned that Governments have a range of funding mechanisms, tax incentives and subsidies at their disposal to stimulate CCS investments<sup>18</sup>, but that only the UK has introduced a substantial specific CCS funding program.

The group gave the European Commission the advice to revise non-regulatory Guidance Documents and to consider some issues which affect CCS in other Directives, in particular the EU-ETS Directive. Moreover, the European Commission should examine several issues of potential concern in the CCS Directive in approximately five years' time after publication of their report in 2015. The European Commission followed the advice and in 2019 presented a report on the implementation of the Carbon Capture and Storage Directive. Up till the time of writing of this Chapter (September 2021), the report did not result in a proposal to amend Directive 2009/31/EC on the geological storage of carbon dioxide and not in a proposal for rules at a European level for implementing tax incentives to promote carbon capture and storage.

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17 Triple, Ricardo-AEA and TNO, Support to the review of Directive 2009/31/EC on the geological storage of carbon dioxide (CCS Directive), Final deliverable under Contract No 340201/2014/679421SER/CLIMA.C1, <http://trinomics.eu/wp-content/uploads/2015/05/lr>

18 Also including grant schemes, loan guarantees, green certificates, purchase contracts, emissions performance standard, feed-in-tariffs, certificate schemes.

Contrary to my expectations, the Green Deal<sup>19,20,21</sup> is silent in respect of carbon capture and storage. This might be explained— as Martha observed in her publication mentioned above – by the fact that carbon capture and storage is a long and winding process. In respect of carbon taxes, Douenne and Fabre found that the public overestimate the negative impact of such taxes on their purchasing power, wrongly think it is regressive, and do not perceive it as environmentally effective. However, Douenne and Fabre show that correction of these biases makes carbon taxes socially acceptable<sup>22</sup>. In respect of carbon capture and storage such a correction of perception is also needed. The CCS technology nowadays has a solid scientific foundation, but public awareness of CCS is still very low. A review of 135 articles in the period 2002-2018 on the role of public support during the implementation of CCS projects and a sample of 1520 American residents

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- 19 The Green Deal is a package of proposals by the European Commission on 14 July 2021 to make the EU's climate, energy, land use, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_21\\_3541](https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541)
- 20 Taxation policies will be aligned with the European Green Deal objectives. The proposed rules aim at: (a) promoting clean technologies and removing outdated exemptions and reduced rates that currently encourage the use of fossil fuels; (b) reducing the harmful effects of energy tax competition; and (c) helping secure revenues for Member States from green taxes, which are less detrimental to growth than taxes on labor. The proposal is to amend the Energy Directive in such a way that there will be a switch from volume to energy content based taxation; incentives for fossil fuel use will be eliminated; and energy products (used as motor or heating fuels) and electricity into categories and by ranking them according to their environmental performance. Moreover, the current tax structure will be simplified by grouping energy products (used as motor or heating fuels) and electricity into categories and by ranking them according to their environmental performance. Proposal for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast) COM(2021) 563 final.
- 21 The European Commission also proposes a new carbon border adjustment mechanism putting a carbon price on imports of a targeted selection of products to ensure that ambitious climate action in Europe does not lead to 'carbon leakage'. The aim is to ensure that European emission reductions contribute to a global emissions decline and to encourage industry outside the EU and the EU's international partners to take steps in the same direction. Amendment to the Renewable Energy Directive to implement the ambition of the new 2030 climate target, [https://ec.europa.eu/info/files/amendment-renewable-energy-directive-implement-ambition-new-2030-climate-target\\_en](https://ec.europa.eu/info/files/amendment-renewable-energy-directive-implement-ambition-new-2030-climate-target_en), p. 7.
- 22 Thomas Douenne and Adrien Fabre, *Yellow vests, carbon tax aversion, and biased beliefs*, January 2020, [https://www.researchgate.net/publication/333507553\\_Yellow\\_Vests\\_Carbon\\_Tax\\_Aversion\\_and\\_Biased\\_Beliefs](https://www.researchgate.net/publication/333507553_Yellow_Vests_Carbon_Tax_Aversion_and_Biased_Beliefs). These authors also find that people's beliefs are persistent and their revisions biased towards pessimism so that only a small minority can be convinced.



in October 2018<sup>23</sup> found that to make this technology socially acceptable first more social studies are required<sup>24</sup>. Based on social studies, a program can be developed for informing the public about safety aspects and advantages and disadvantages of CCS.

After such acceptance has been ensured, it is time for the amendment of Directive 2009/31/EC on the geological storage of carbon dioxide. Such an amendment might include a European-wide tax incentive. Such a tax incentive might also be included in a common corporate income tax base, but this would only be a proper place if such a common tax base would apply to all companies operating in the EU, small and large, including both, with legal bodies paying corporate income tax and entrepreneurs subject to personal income tax. Thus far the European Commission's proposals for harmonizing the tax base for taxation of profits only concern corporate income taxpayers<sup>25</sup>.

#### 4 U.S. experience

The EU may take the U.S. experience with a tax credit as a tool for incentivizing investment in carbon capture and sequestration as an example. The U.S. introduced such a tax credit in 2008 (Internal Revenue Code [IRC] Section 45Q). As of 2018, the credit can be claimed for all carbon oxides, not just CO<sub>2</sub> (carbon dioxide). Geological sequestration of carbon is the process of injecting carbon oxides into underground geological formations, where they are either permanently trapped or transformed. Usually this process involves CO<sub>2</sub>, although injection and sequestration of other carbon oxides (e.g., carbon monoxide) is also possible. Geological sequestration is the final step in a CCS system. In the U.S. 12 projects capturing and injecting CO<sub>2</sub> were operating mid-2021. The tax credit is computed per metric ton of qualified carbon oxide captured and sequestered. The amount of the credit, as well as various features of the credit, depend on when the qual-

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23 Pianta, Rinsheid and Weber, 'Carbon Capture and Storage in the United States: perceptions, preferences, and lessons for policy' (2021), *Energy Policy* 151 <https://www.sciencedirect.com/science/article/pii/S0301421521000185?via%3Dihub>

24 Pavel Tcvetkov, Alexey Cherepovitsyn and Sergey Fedoseev, *Public perception of carbon capture and storage: A state-of-the-art overview*, <https://pubmed.ncbi.nlm.nih.gov/31867452/>

25 Proposal for a Council Directive for a Common Corporate Tax Base COM(2016) 685 final; Proposal for a Council Directive for a Common Corporate Income Tax Base COM(2016) 683 final applying only to very large companies. On 18 May 2021, the European Commission issued a communication on "Business Taxation for the 21st Century" in which it announced amongst others its plans to replace the 2016 C(C)CTB-proposal by a Business in Europe: Framework for Income Taxation (BEFIT) in 2023 providing for a single corporate tax rulebook for the EU, based on apportionment and a common tax base. [https://ec.europa.eu/commission/presscorner/detail/es/qanda\\_21\\_2431](https://ec.europa.eu/commission/presscorner/detail/es/qanda_21_2431)

ifying capture equipment is placed in service. The EU might well take the U.S. experience with this tax credit as example<sup>26</sup>.

## 5 Conclusion

Carbon capture and storage may be a powerful tool in the fight for climate change. Making the public aware of the safety of CCS is one way to promote CCS. The U.S. experience shows that the introduction of a tax credit may also be a useful instrument.

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<sup>26</sup> Angela Jones and Molly Sherlock, Congressional Research Service, The Tax Credit for Carbon Sequestration (Section 45Q), 8 June 2021, <https://crsreports.congress.gov/product/details?prod-code=IF11455>