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<cn>15.<ct>Towards a ‘third dividend’ analysis for innovative environmental taxation policies and allocations: a smart instrument mix for the reduction of CO₂ emissions

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<a>15.1INTRODUCTION

The double dividend analysis is a common way to encompass the beneficial effects of environmental taxes. Indeed, by earning some revenues and reducing harmful behaviours for the environment, governments can use environmental taxes for both environmental and budgetary reasons. However, the allocations of these environmental tax incomes are not always used for environmental-friendly purposes. Therefore, not only do these taxes sometimes fail in drastically reducing CO₂ emissions, but their potential allocation to environmentally harmful sectors can even make them counterproductive. This chapter aims to explore possibilities of innovative taxation and income allocation to reverse this existing trend.

First, the chapter discusses the possibility of implementing a tax creating a ‘third dividend’ in the current tax law framework. It begins with a discussion of the concept of double dividend as described in the literature. Then, it explores the possibility of a potential ‘third dividend’ from the taxation of fossil resources extraction. This tax income could come from licencing the extraction or directly from selling the fossil resources to the consumer, and therefore could be added to the double dividend classically recognised with environmental taxes (reduction of negative externalities and tax incomes). To this end, the chapter will analyse the legal framework surrounding the implementation and allocation of revenues coming from an ‘extraction tax’, focusing on practical and legal limits that States would encounter under European law.

Second, this chapter proposes to magnify the effect of such a ‘third dividend’ from ‘extraction taxes’ to reduce CO₂ emissions by allocating these tax revenues to low-carbon social innovations. Indeed, the reasoning underlying this governance tool that is taxation will be put into question in the light of the necessity to switch from a paradigm of ‘heteroregulation’ of individuals to one of human autonomy in order to increase environmental-friendly behaviours. To this end, take a glimpse of the existing ecological innovations already undertaken by citizens through two existing bottom-up initiatives: a community-led renewable energy project and a town gathering a myriad of local low-carbon resilient initiatives. It is our view that mixing top-down instruments with bottom-up tools could constitute smart instrument mixes capable of galvanising the ecological transition towards sustainable societies.

15.2 THE IMPLEMENTATION OF AN ‘EXTRACTION TAX’ CREATING A ‘THIRD DIVIDEND’ IN THE CURRENT ENVIRONMENTAL TAXATION FRAMEWORK

At the beginning of the twenty first century, fossil resources remain the predominant source of energy. Since the Han Dynasty, energy has been taxed because of its luxurious connotation.¹ Today, with the recent climate mitigation objectives, a new purpose for taxation has emerged: taxing fossil energy to reduce emissions. The first part of this chapter explores an innovative option from a tax drafting perspective to mix emissions control and revenues from fossil resources.

15.2.1 Environmental Taxes and Fossil Energies Sectors

The existence of environmental taxation is linked in the economic literature with a market failure to adequately reflect the social cost of the impact of one activity.² ‘To many economic analysts, in situations involving serious externalities, taxes are the most effective mechanism for “getting the prices right”.’³ The discussion about the effect of environmental taxation and the potential benefits for society

traces back at least as far as Pigou. In 1920, in *Economics of Welfare*, Pigou argued that a tax raised against a negative externality will, first, decrease or eliminate the negative externality and, second, grant income that can be used in order to reduce other distortionary taxes.⁴ According to this theory, the general welfare will be improved not only by a cleaner environment but also by a less distortionary tax system. This assumption is discussed by Bovenberg as follows: ‘If the double dividend hypothesis holds, an environmental tax reform is a so-called ‘no-regret’ option; even if the environmental benefits are in doubt, an environmental tax reform may be desirable.’⁵ The double dividend theory and its outcomes were intensively and extensively discussed during the 60s. For instance, Fullerton and Metcalf qualify it as an ‘intellectual foundation’ before concluding, after the presentation of four cases, that ‘the validity of the double dividend theory cannot be settled as a general matter.’⁶ Even market-based instruments such as auctioned tradable permits, with or without grandfathered clause, are questioned under the double dividend theory.⁷ Bovenberg and Lawrence conclude their economic simulations for the US by stating that: ‘the numerical model shows that in the presence of realistic policy constraints, optimal carbon rates are far below the marginal environmental damages – and may even be negative.’⁸

Indeed, the outcome of environmental taxation can be contradictory with the assumptions under the double dividend theory. First, environmental tax aims at reducing negative externalities by taxing them, which also reduces revenues coming from the tax (the ‘second dividend’). Consequently, available incomes to be dedicated to the reduction of distortionary taxes will decrease with time. Second, the global effect of economic indicators and happiness indicators are unknown, especially in the short term where the consequences of excessive fossil energy burning will be less visible than later. In this respect, Pierce shares his doubt in these words: ‘Carbon taxes themselves will impose a deadweight loss which has to be set against the gain from the reduced externality from global warming.’⁹ Third, as (fossil) energy is considered as a production factor as labour, the reduction in the labour cost (due to the reduction of taxation) will be compensated with an at-least-equivalent increase in energy prices. In this respect, Pierce notes that the ‘environmental tax corrects a distortion, namely the externalities arising from the excessive use of environmental services’.¹⁰

However, under the double dividend hypothesis, the environmental tax is applied on the negative externality, mainly CO₂ emissions, coming from the burning of fossil fuels. So the purpose of the tax is to reduce consumption by inducing a higher cost for the acquisition of fossil fuels on the demand side, in a general market at equilibrium. However, the fossil fuels market, and more obviously the oil market, must be seen as inelastic on the supply side. Due to the OPEC cartel and quotas systems, the tax will mainly decrease the price but not the quantity offered on the market.¹¹ Taxing fossil energy when demand is slightly inelastic would consequently only generate a rent for the States, and reduce the profit of fossil energy producers.¹²

15.2.2‘Extraction Taxes’ as an Alternative to an Emissions Trading System and Carbon Taxes

<c>15.2.2.1General concept and assumptions

A broadly unexplored option from a tax drafting perspective is the ‘extraction tax’.¹³ The ‘extraction tax’ option is based on three assumptions: first, every fossil material used as an energy source will end up producing a negative externality (by being burned and emitting aerial pollutants or end up in the ocean or in the ground as pollutant matter); second, this pollution would not occur if the material remained in the ground; third, the final cost of extraction for a fossil fuels producer takes into account all the taxes borne by the producer and is determinant in the investment process. The environmental benefit hidden beyond the ‘extraction tax’ consists of making some production places economically unattractive, or less attractive, as from a certain quantity (see *infra*). It consequently reduces the quantity of fossil energy offered on the market, and the subsequent pollution, and it could also foster low-carbon initiatives.

<c>15.2.2.2Drafting of an ‘extraction tax’

The main objectives of the ‘extraction tax’ can be seen as two sides of the same coin: reducing the quantity offered on the market on the one hand and raising up the price of fossil energies to make it less competitive in comparison with renewable options on the other. Consequently, the drafting of the ‘extraction tax’ should aim to influence the quantity offered for consumption by taxing the extraction of the product. Different tools exist to reach such an objective, with different efficiency: increasing the corporate tax for petrol, gas and coal companies;¹⁴ offering proportional concession fees, with duties based on the quantity extracted; or making investments in prospection and extraction facilities non-deductible from incomes earned by the extracting companies.

Are consequently ‘extraction taxes’ more efficient than classic carbon taxes? Carbon taxation and ‘extraction taxes’ are not contradictory nor mutually exclusive. Indeed, similarities between both of them exist: both apply on the energy market, both have an impact on the final quantity exchanged¹⁵ and both will be, in the end, economically supported by the final consumer, although the addressees of the taxes are different – the supply side for ‘extraction tax’ and the consumption side for carbon taxes. A comparison of both tax tools will reveal different advantages and disadvantages.

On the level of the taxpayer, environmental taxes are mainly paid by the polluter (the final consumer) when extraction or severance duties are paid by the extractor. Because it only exists for a few extracting companies, compliance and collection costs are less important for ‘extraction taxes’. However, the costs of collection will be shared by countries owning fossil resources.

As for beneficiaries of tax incomes, beneficiaries of both emission and ‘extraction taxes’ and fees are similar: States. However, the spreading of those tax incomes will be different: if externalities are taxed, the revenue will be shared between the States where the consumption occurs; if extraction is taxed, States where fossil fuels are extracted will benefit from the incomes. Every State is a fossil fuel consumer, although all countries are not equal from a proportional perspective. But not every country possesses fossil resources. Consequently, on the one hand, ‘extraction taxes’ can be seen as more distortionary than environmental taxes targeting emissions, as they are less linked with the polluting

behaviour. On the other hand, because of this discrimination in the original allocation of natural resources, taxing the production is an easier option to implement from a political point of view. It allows States to address energetic transition from a global perspective by supporting taxation by ‘exporting States’ on their own natural resources and authorising them to keep the income. This option seems easier than attempting to discuss at an international level the repartition of emissions quotas and their control, without any real impact on the quantity of pollutant matters offered on the market.

When it comes to the impact on supply¹⁶, as exposed on the previous section, an environmental tax on negative externalities can be interpreted by the market in two ways: an increase in price and/or a reduction of the quantity of fossil products supplied. Because of strong collusion between actors on the supply side of the fossil products market, the quantity offered is less dependent on price, as is the case in oligopolies or monopolies. ‘Extraction taxes’ can have the same effect: the extraction company passes on the extraction cost to the market, and the price increases. As a consequence, demand will be weakened and the supplier will be forced to adjust the quantity or accept a smaller profit. However, it could also lead to some extraction projects not being profitable while also directly reducing the quantity offered, which is not possible with environmental taxes, because the taxes are collected at a subsequent level of trading and do not have an impact on the level of profitability of extraction projects.

Finally, considering the leakage, one must recall that carbon leakage is a direct consequence of the adoption of carbon taxes by some but not all States. To avoid the payment of environmental taxes, companies relocate their production plants outside the zone where the tax is levied. The more carbon intense the industry is, the stronger the incentive to relocate will be. Again, geography argues in favour of ‘extraction taxes’: if fossil energy products are available everywhere around the globe, that is not the case for places where they can be extracted. Consequently, extraction or severance duties could hardly be leaked.

Nevertheless, environmental taxes and ‘extraction taxes’ can be combined for a concurrent effect. In Norway¹⁷, the petroleum sector represents a large part of the economy (15 per cent of the GDP, 20 per

cent of the State's revenues, 26 per cent of all investments made in the country and 40 per cent of the value of the exports). For taxing the activities of oil companies, the Norwegian government uses three tax tools: first, a CO₂ tax on the fossil fuels consumed by oil companies; second a special bracket in the income taxation regime applied only to oil companies, raising the total income tax to 73 per cent of the profit (25 per cent normal rate plus 53 per cent special rate); and third, the EU emissions system that included all extracting installations. As a consequence, extracting companies purchase permits to cover CO₂ emissions coming from the plants. The special income tax, that can be considered as an 'extraction tax', raised 104 billion NOK revenues for Norway in 2014. Since the 70s, a strong correlation can be demonstrated between natural resources incomes and GDP evolution.

<c>15.2.2.3The different ways to obtain the double and third dividends

As shown in the previous section, environmental taxes and extraction duties are not incompatible and they mutually strengthen their respective effects. Indeed, taxpayers are different, as is their ability to pay. Consequently, tax rates are carefully designed, in order to get three dividends: (1) the improvement of the environment and the reduction of emissions (from both extraction and environmental taxes); (2) tax incomes (from the environmental taxes); (3) part of the profit coming from the exploitation of the national natural resources that can be used to compensate the natural damage ('extraction taxes').¹⁸

For the last dividend, the message sent by the State will therefore be different according to the tax rate adopted for the extraction duties. In this respect, tax rates can take different shapes. First, it could take the shape of a flat rate, reflecting that every gallon of natural resource extracted has the same value, although the marginal unit has an inferior social impact than the first unit. Second, the tax rates could be a progressive tax rate, limiting the quantity of natural resources extracted by making it more and more expensive. It would maintain high prices even in the case of restricted demand and allow primary needs to be covered by exempted or less taxed units of fossil fuels. Third, the tax rate could take the form of an extraction permits trading system. As for every trading system, the more spread it is, the more efficient the control of emissions will be. It is the best option to meet climate objectives (better

than the emissions trading system) because the amount of pollutant is controlled instead of the pollution, so it is materially impossible to release more emissions than the ones contained in the extracted materials. Although the quantity exchanged on the market is inferior compared to having no control, States can still get profits and important revenues by auctioning the extraction permits. From our perspective, the last option is the best, followed by the second one, because of the strong incentive to reduce the CO₂ emissions they create.

15.2.3 The Legal Limits Related to an ‘Extraction Tax’

15.2.3.1 The legal constraints regarding the implementation of an ‘extraction tax’

As announced in the introduction, only legal limits at the European level are discussed in this section. As for any tax initiative, the first limit remains free movement of goods, capital, services and people within the EU. When designing the ‘extraction tax’ as an indirect tax similar to excises levies, article 2 of Directive 2008/118/EC¹⁹ states as follows:

“Member States may levy other indirect taxes on excise goods for specific purposes, provided that those taxes comply with the Community tax rules applicable for excise duty or value added tax as far as determination of the tax base, calculation of the tax, chargeability and monitoring of the tax are concerned, but not including the provisions on exemptions.”

In their reading of the directive, Terra and Vettel summarised the option given to Member States by the Directive: ‘Member States may add, for specific policy (for example environmental) purposes, other indirect taxes to excise goods.’²⁰ This means that Member States, when exercising this option, shall not jeopardise the rules related to the internal market, more precisely the free movement of goods and services.²¹ If the extraction tax takes the shape of a turnover tax, the 6th Directive²² prohibits the introduction of taxes, duties or charges that can be characterised as turnover taxes. The interpretation of these provisions is restrictive, giving a large leeway to Member States. Consequently, this kind of tax will be challenge by the European Court of Justice if not adopted at the European level. Nevertheless, article 33 clarifies that Member States are authorised to maintain excises duties.²³

Regarding extraction tax as a modality of company income taxation, no EU legal constraint forbids Member States to discriminate against fossil energy producers, among others, as long as national production is not treated differently than imported products. The main constraints remain at the national level: several States' Constitutions include provisions prohibiting discrimination between taxpayers based on their activities.

15.2.3.2 The legal constraints regarding the allocation of incomes

As for adoption constraints, allocation of income coming from extraction companies or environmental taxes is not controlled at the European level as long as it cannot be qualified as illegal State aid. Again, limits exist mainly at the national level, as the three following examples illustrate.²⁴ For instance, in Belgium, globalisation of all tax incomes is mandatory prior to their allocation to specific objectives.²⁵ Moreover, in Sweden, in the late 80s and early 90s, the Swedish Environmental Charges Commission were given the task of designing environmental levies and making recommendations regarding the allocation of revenues coming from environmental levies, mainly by promoting specific environmental goals²⁶. Lastly, in Norway, taxes collected from the oil companies and dividends received from StatOil shall be invested in a special fund ('the Government Pension Fund Global') 'intended to be managed so that Norway's petroleum wealth benefits future generations as well.'²⁷

From a tax design perspective, the allocation could have three effects on the environment and on the tax system. First, it could annihilate (totally or partially) the effect on the environment (first dividend) when the income is used to maintain reduced or no taxation on fossil energy products. Second, it could be neutral, in the sense that revenues will be dedicated to environmental impact-free tax reduction, for example global income taxation or sale tax reduction. Third, it could strengthen the environmentally positive effect by reinvesting the income in sustainable projects, and thereby creating a mutual reinforcement of two kinds of policies.

In our view, the last option is the most efficient to limit CO₂ emissions and accelerate the transition towards sustainable societies. Different projects of environmental-friendly initiatives are described in the next section, to bring inspiration for recycling income coming from environmental and ‘extraction taxes’ in a sustainable and bottom-up way.

15.3 ONE STONE, TWO BIRDS: ALLOCATION OF THE ‘EXTRACTION TAX’ TO FINANCE THE TRANSITION TOWARDS SUSTAINABLE SOCIETIES

In light of the limits of the current legal framework for environmental tax allocation, this chapter will now present various innovative proposals of allocation, based on existing initiatives undertaken in European States. This possible allocation pattern would complement the positive effects on the environment of the ‘extraction tax’.

15.3.1 The Necessity to Finance Social Innovations for the Transition towards Sustainable Societies

It is suggested to allocate this tax revenue to ecological and low-carbon social innovations led by citizens. This proposition relies on the hypothesis that environmental-friendly behaviours will be more resilient if, in addition to external incentives stemming from economic or regulatory measures, people’s intrinsic motivations to change are fostered.²⁸ Top-down measures pertaining to the sphere of taxations, regulations, market-based incentives and penalties are necessary in order to generate environmental-friendly behaviours, but they are not sufficient to reach this goal. Therefore, to have a smart instruments mix that would be sufficient to trigger a transition towards sustainable societies,²⁹ it is proposed to complement the necessary top-down measures with bottom-up tools.

Indeed, it is assumed that top-down measures strengthen ‘the heteroregulation of the functioning of society’.³⁰ Such functioning can be environmental-friendly, but it will be so independently of any change

in the mentalities, value systems, intentions and motivations of citizens.³¹ By using economic incentives, public policies can strive for a result – namely, the reduction of the environmental impact – that needs to be neither understood nor approved by its addressees, whether they are companies, local communities or citizens.³² This trend for looking only to economic incentives to establish environmental-friendly measures springs from the fact that public policies and governmental actions are still mainly evaluated in economic terms, as the regulation principle of the power over individuals is found in the paradigm of *homo economicus*.³³ According to Michel Foucault, this *homo economicus* is considered as ‘eminently governable’, as he systematically and automatically answers to modifications chosen for him and introduced artificially into his environment,³⁴ such modifications being price incentives in the field of taxation governance. To empower human beings to create their own norms for actions that are ‘compatible with the permanence of a genuine human life’³⁵ would necessitate substituting the paradigm of heteronomy, that underlies environmental taxation, for the paradigm of autonomy.³⁶

The need to rely on the diversity of citizens’ actions to invent environmental-friendly social innovations is even more necessary as it can increase the resilience of a community against future crises and improve the cohesion and learning ability of a community when it has to adapt to new circumstances.³⁷ Indeed, a social innovation can be defined as ‘the product of a need, a desire, an aspiration or a search for solutions to a social problem’ and springs mostly from local and territorially anchored actions.³⁸ It is therefore a way of empowering people so that they can invent contextualised solutions adapted to local and particular conditions.³⁹ These citizen-based social innovations already exist, but they often rely on the support of public authorities and on an institutional framework to survive, whether in the form of information, knowledge-sharing, access to networks, diffusion, subsidies or help to formalise concrete proposals.⁴⁰ The governance challenge for public authorities is to support these initiatives without taking away the bottom-up logic and the creativity and energy potential driven by the community.

15.3.2 Several Examples of Community-based Social Innovations across the European Union

These community- and citizen-based social innovations can – and, in order to increase the resilience that springs from diversity, should – take different shapes. Across the European Union, there are about 2000 local low-carbon initiatives⁴¹ ranging from transition towns and eco-villages to energy or food cooperatives. In this chapter, only two representative initiatives will be presented: a community energy project in Samsø (Denmark) and a ‘transition town’, Totnes (the United Kingdom).

<c>15.3.2.1The community energy project in Samsø (Denmark): a combination of community and financial incentives

In 1997, in the framework of a national competition for local communities to realise a transition to self-sufficiency with renewable energy launched by the Danish government, Samsø decided to abandon fossil fuels and meet all its energy needs using renewable sources. The competition emphasised the importance of local participation and innovation in terms of organising, financing and owning the renewable energy project.⁴² Therefore, the local community proposed a mix of initiatives, organised through cooperatives and financing schemes, ensuring a strong involvement of local citizens, and with governmental support: biomass district heating systems, combined heat and power schemes, windmills and solar panels projects, and a sustainable transport initiative.⁴³

Among these different low-carbon initiatives, the district heating projects received public grants from the Danish Energy Authority, and mortgage loans from the municipality.⁴⁴ The citizens’ participation in these projects is high, as local citizens’ groups for each district heating area participated in public meetings on this project and in promoting the creation of new district heating systems. Moreover, the ownership of the district systems is often that of a cooperative, thereby allowing a high level of inclusion for the citizens.⁴⁵ Furthermore, the land-based wind turbines project is enabled thanks to an ownership scheme reserving shares for the general public (individual or small-scale cooperatives), giving every citizen the opportunity to invest in a wind turbine. In addition, a financial incentive through fixed and preferential electricity prices compared to the price of offshore wind turbines has been guaranteed by the government, thereby ensuring the financial profitability of the investment.⁴⁶ This combination of a

secure energy supply reassuring people regarding their energy future, environmental motivations connecting local people to global stakes, and financial incentives, stimulated by regular inclusive public meetings, ensured a broad acceptance for the implementation of the turbine. Moreover, this local and collective ownership of sustainable energy overcame the traditional problem of the local NIMBY (Not In My Back Yard) opposition to green energy projects. The project initiators theorise the importance of local participation for these energy projects in the concept of ‘community’, combining the theory of the commons⁴⁷ with the importance of local community.⁴⁸

A potential allocation of the ‘extraction tax’ could therefore consist of ensuring fixed but competitive prices for renewable energy produced by community-owned energy sources as compared to classical renewable energy investment by energy companies, as well as a system facilitating loans and grants for such investments. In this Danish case, an average investment of €13 333 and public subsidies of €1000 per capita, in an island of 4000 inhabitants, allowed the island to become 100 per cent self-sufficient with renewable energy using local resources, not emitting any CO₂ emissions and exporting its energy surplus to the mainland.⁴⁹ The example of Samsø shows that such a possible allocation of the ‘extraction tax’ could foster the reduction or even the halt of CO₂ emissions, but that this energetic transition is rendered possible by an internalisation of the environmental stakes by individuals and a subsequent strong citizens’ mobilisation and involvement in renewable energy projects.⁵⁰

<c>15.3.2.2Transition town: the pioneer example of Totnes (United Kingdom)

Established in 2006, Transition Town Totnes (TTT) is a community organisation managing a number of funded projects strengthening the Totnes local community in its social, economic and energetic aspects and improving its resilience towards and independence from fossil energy.⁵¹ It acts as an umbrella and a support office for community groups that are engaged in 20 projects, in a wide array of themes such as sustainable construction, food production, transport or finance.⁵²

Among the numerous citizens' initiatives that arose in Totnes is the 'Transition Streets' project aiming at improving energy efficiency and reducing reliance on fossil fuels, as well as strengthening the community's resilience. Thanks to the grants given by the government to invest in domestic panel system, 468 households, divided into 56 groups of neighbours, saved £570 per year and reduced their CO₂ emissions by 1.3 tons, while creating social ties among the neighbourhood and increasing community resilience.⁵³ Another community-led project fostered by TTT is the Transition Homes Community Land Trust, with the purpose of also improving the energy efficiency of a house and developing an affordable comprehensive housing by using renewable energy, natural and local resources, as well as by creating sustainable food production with gardens and collective growing areas.⁵⁴ Lastly, the city has launched the project 'Incredible Edible', which encourages people who grow vegetables, fruit, herbs and nuts to gather in public unused spaces in Totnes and share their produce, thereby relocating the food production and building social cohesion through convivial skill-sharing.⁵⁵

As a result of all these initiatives, the community increased its resilience in case of energetic, economic, social or climate crises thanks to a reduction of its use of and reliance on fossil energy as well as its strengthening of social cohesion. Such resilience is also fuelled by the relocation of the economic exchanges thanks to the Totnes pound, a local currency helping to build the local economy.⁵⁶

In light of this experience, a potential allocation of the 'extraction tax' could consist of public grants for materials that reduce domestic energy use and increase local food production. Moreover, this example also shows the importance of the existence of a dynamic community organisation galvanising local projects. Such an organisation needs to be financed in order to carry out its task to support and assist services in terms of access to resources, information, knowledge and skills. Moreover, the organisation also coordinates different initiatives in a community so that it effectively becomes a transition town and benefits from the positive synergy stemming from the harmonisation of different projects. Lastly, it shows that networking services are indispensable in stimulating exchanges among the different transition projects, and that there is also a crucial need for the development of methodologies for identification, assessment and diffusion of good practices.

15.4 CONCLUSION

In face of the necessity to drastically change our natural resources production and consumption in order to meet the objectives of the COP 21 Paris Agreement, following the IPCC recommendations to remain below a 2°C warming compared to pre-industrial levels by 2100,⁵⁷ there is a need to expand political imagination for mixing smart instruments. Beyond environmental taxes, ‘extraction taxes’ would kill two birds with one stone by, on the one hand, allowing for an important reduction of fossil resources supply in energy markets, and on the other hand, raising revenues from common resources to support innovative ecological projects. These social innovations increase the autonomy of citizens and communities and their independence towards fossil resources, at the same time as their resilience against external shocks, and therefore contribute to the ecological transition towards sustainable societies. In addition to, and in combination with, the top-down instruments (environmental taxations, regulations, emissions trading schemes and environmental market-based mechanisms), it is therefore proposed to foster the existing and growing bottom-up, citizen- and community-based innovations through the ‘extraction tax’.

NOTES

¹ Ben JM Terra, 'Excises' in Victor Thuronyi (ed), *Tax Law Design and Drafting* (vol. 1, International Monetary Fund 1996) 2.

² See for example: Jean Hindriks and Gareth D Miles, *Intermediate Public Economics* (2nd edn, MIT 2011); Charles D Kolstad, *Environmental Economics* (2nd edn, OUP 2010) ; Jon M Conrad, *Resource Economics* (2nd edn, CUP 2010).

³ Lawrence H Goulder, 'Environmental Taxation and the “Double Dividend”: A Reader’s Guide’ (1994) *NBER Working paper series*, 4896.

⁴ Arthur C Pigou, *The Economics of Welfare* (MacMillan 1920).

⁵ Arij Lans Bovenberg, 'Green Tax Reforms and the Double Dividend: An Updated Reader’s Guide’ (1999) 6 *International Tax and Public Finance* 421, 423.

⁶ Don Fullerton and Gilbert E Metcalf, 'Environmental Taxes and Double-Dividend Hypothesis: Did You Really Expect Something for Nothing?’ (1997) *NBER Working papers series* 6199.

⁷ John C Pezzey and Andrew Park, 'Reflections on the Double Dividend Debate' (1998) 11 *Environmental and Resource Economics* 539.

⁸ Arij Lans Bovenberg and Lawrence H Goulder, 'Optimal Environmental Taxation in the Presence of Other Taxes: General-Equilibrium Analyses' (1996) 86 *The American Economic Review* 985.

⁹ David Pierce, 'The Role of Carbon Taxes in Adjusting to Global Warming' (1991) 101 *Economic Journal* 938.

¹⁰ *ibid* 940.

¹¹ During the last financial crisis, causing a contraction of the demand, the price has dropped by more than 40 per cent, but the quantity only adjusts at the margin. See *Annual Reports* and *Monthly Reports* from the OPEC.

¹² For an in-depth analysis of this subject, see: Adele C Morris, 'The Challenge of State Reliance on Revenue from Fossil Fuel Production' (2016) *Climate and energy economics discussion papers* 8.

¹³ For an early discussion about severance duties, see: Harold Hotelling, 'The Economics of Exhaustible Resources' (1931) 39 *The Journal of Political Economy* 137.

¹⁴ Assumption is made that the profit function of the extraction company is impacted in the same way as the quantity of fossil resources extracted.

¹⁵ For example, on 7 December 2015, OPEC announced its intention to raise the quotas for oil production. Immediately, oil dropped by 2.7 per cent on New York markets. (Grant Smith, 'OPEC Unshackled From Quota Could Add Millions of Barrels' *Bloomberg* (7 December 2015) <http://www.bloomberg.com/news/articles/2015-12-07/opec-unshackled-from-quota-could-add-millions-of-barrels-in-2016> accessed 8 November 2016.

¹⁶ All assumptions made in this section are based on the general market equilibrium exposed in Andreu Mas-Colell, Michael D Whinston and Jerry R Green, *Microeconomic Theory* (1st edn, OUP 1995).

¹⁷ All data are coming from: Ministry of Petroleum and Energy and the Norwegian Petroleum Directorate, 'Everything you need to know about Norwegian petroleum activities' <<http://www.norskpetsroleum.no/en/economy/management-of-revenues/>> accessed 10 November 2016.

¹⁸ For an extended discussion about the revenues received by States and some empirical estimations, see: Jeremy G Weber, Yongsheng Wang and Maxwell Chomas, 'A Quantitative Description of State-Level Taxation of Oil and Gas Production in the Continental US' (2016) *MPRA Papers* 71733.

¹⁹ Council Directive 2008/118/EC of 16 December 2008 concerning the general arrangements for excise duty and repealing Directive 92/12/EEC [2008] OJ L9/12.

²⁰ Ben JM Terra and Peter J Wattel, *European Tax Law* (6th edn, Kluwer Law International 2012) 468.

²¹ *ibid*.

²² Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax, OJ L347/1, 1-118.

²³ *ibid*. art 33.

²⁴ Although not an EU Member State, the Norwegian example interestingly illustrates the legal constraints that can exist regarding income allocation.

²⁵ Belgian Constitution, arts 170 to 172.

²⁶ Pia Nyman, 'Environmental Taxes – The Case of Sweden' (1997) http://hdr.undp.org/sites/default/files/nyman-pia_taxes-sweden.pdf accessed 8 November 2016.

²⁷ Ministry of Petroleum and Energy and the Norwegian Petroleum Directorate, 'Management of Revenues', <<http://www.norskpetroleum.no/en/economy/management-of-revenues/>> accessed 10 November 2016.

²⁸ Olivier De Schutter, 'La cage et le labyrinthe: s'évader de la religion de la croissance' (21st Congress of Belgian Economists, Liège, 26 November 2015) 10.

²⁹ This expression comes from Olivier De Schutter, 'The EU's fifth project: transitional governance in the service of sustainable societies – Framing paper' (Francqui International Conference 2014, Brussels, 8-9 May 2014), where sustainable societies are defined as 'societies in which the needs of the present are met without jeopardizing the ability of the new generations to meet their own needs'. For further references on the concept of 'transition', often referred to as 'ecological transition', see Frank W Geels and Johan Schot, 'Typology of Socio-technical Transition Pathways' (2007) 36 *Research Policy* 399; Rob Hopkins, *The Transition Handbook: From Oil Dependency To Local Resilience* (Green Books 2008); Derk Loorbach, *Transition Management: New Mode of Governance for Sustainable Development* (International Books 2007).

³⁰ André Gorz, *Ecologica* (Galilée 2008) 46.

³¹ *ibid.*

³² *ibid.*

³³ Michel Foucault, *Naissance de la Biopolitique, Cours au Collège de France (1978–79)* (Seuil/Gallimard 2004) 249–258.

³⁴ *Ibid.* 272–274.

³⁵ Hans Jonas, *The Imperative of Responsibility* (University of Chicago Press 1985) 11.

³⁶ The concept of *autonomy* should be understood as the ability of human beings or collectivities to create their own norms (Cornelius Castoriadis, *L'institution imaginaire de la société* (Seuil 1975) 101).

³⁷ De Schutter (n 28) 3.

³⁸ Juan-Luis Klein, Jean-Louis Laville and Frank Moulaert, 'L'innovation sociale: repères introductifs' in Juan-Luis Klein, Jean-Louis Laville and Frank Moulaert (eds), *L'innovation sociale* (Erga 2014) 11 (free translation). For further developments on the concept of social innovation, see also: Social Innovation eXchange and the Young Foundation for the Bureau of European Policy Advisors, 'Study on social innovation' (2010) <<http://youngfoundation.org/wp-content/uploads/2012/10/Study-on-Social-Innovation-for-the-Bureau-of-European-Policy-Advisors-March-2010.pdf>> accessed 10 October 2016.

³⁹ De Schutter (n 28) 20.

⁴⁰ Olivier De Schutter and Jacques Lenoble, 'Introduction. Institutions Equipped to Learn' in Olivier De Schutter and Jacques Lenoble (eds), *Reflexive Governance: Redefining the Public Interest in a Pluralistic World* (Hart 2010) xxii.

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- ⁴¹ AEIDL, 'Europe in Transition: Local Communities Leading the Way to a Low-carbon Society' (2013) <<http://www.aeidl.eu/en/news/what-s-new-at-aeidl/1096-europe-in-transition-local-communities-leading-the-way-to-a-low-carbon-society.html>> accessed 14 October 2016.
- ⁴² PlanEnergi and Samso Energy Academi, 'Samso – A Renewable Energy Island. 10 years of Development and Evaluation' (2007) 7 <<http://energiakademiet.dk/wp-content/uploads/samso-renewable-energy-island.pdf>> accessed 13 October 2016.
- ⁴³ AEIDL (n 40) 23.
- ⁴⁴ PlanEnergi and Samso Energy Academi (n 41) 41–42.
- ⁴⁵ *ibid* 42.
- ⁴⁶ *ibid* 21.
- ⁴⁷ Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (CUP 1990).
- ⁴⁸ Tor Norretranders and Søren Hermansen, *Commonity = Common + Community* (2nd edn, Samso Energiakademi 2013).
- ⁴⁹ PlanEnergi and Samso Energy Academi (n 41) 36, 43 and 48.
- ⁵⁰ *ibid* 49–50.
- ⁵¹ For more information on these initiatives, see <https://www.transitiontowntotnes.org/>.
- ⁵² AEIDL (n 40) 7.
- ⁵³ Transition Town Totnes, *Transition Streets. Final project report* (September 2011), 3 <<http://www.transitiontogether.org.uk/wp-content/uploads/2012/07/TransitionStreets-finalreport-27Sep2011.pdf>> accessed 15 October 2016.
- ⁵⁴ De Schutter (n 28) 18, for more information on this project, see <https://www.transitiontowntotnes.org/transition-homes/>.
- ⁵⁵ For more information on this project, see <https://www.transitiontowntotnes.org/incredible-edible/>.
- ⁵⁶ Rob Sharp, 'They don't just shop local in Totnes – they have their very own currency' *The Independent* (1 May 2008) <<http://www.independent.co.uk/news/uk/this-britain/they-dont-just-shop-local-in-totnes-they-have-their-very-own-currency-818586.html>> accessed 7 November 2016.
- ⁵⁷ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014, Synthesis Report, Summary for Policymakers* <<https://www.ipcc.ch/report/ar5/syr/>> accessed 6 November 2016.