



Choosing Efficient Combinations of Policy Instruments
for Low-carbon development and Innovation to Achieve
Europe's 2050 climate targets

Country report: Czech Republic

WP 1 – Taking stock of the current instrument mix

Contribution to Deliverable 1.2: Review of the existing instrument mix at EU level and in
selected Member States

THEME [ENV.2012.6.1-4] [Exploiting the full potential of economic instruments to achieve the
EU's key greenhouse gas emissions reductions targets for 2020 and 2050]

Grant Agreement number: 308680



Funded by the European Union



ACKNOWLEDGEMENT

The research leading to these results has received funding from the European Union FP7 ENV.2010.6.1-4 grant agreement n° 308680.

AUTHOR(S)

Vojtěch Máca, Charles University in Prague, Environment Center

With thanks to:

Milan Ščasný, Charles University in Prague, Environment Center,
Paul Drummond, UCL Energy Institute, and
participants of the *Super Solidam Petram* seminar held on 14. 3. 2013 in Prague

Project coordination and editing provided by Ecologic Institute.

Manuscript completed in March 2013, revised in August 2013

This document is available on the Internet at: www.czp.cuni.cz

DISCLAIMER

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of the following information. The views expressed in this publication are the sole responsibility of the author and do not necessarily reflect the views of the European Commission.

Reproduction and translation for non-commercial purposes are authorized, provided the source is acknowledged and the publisher is given prior notice and sent a copy.

Table of Contents

- 0 Executive summary 4**
- 1 Description of policy landscapes 4**
 - 1.1 Classification of the instruments previously selected into policy landscapes..... 4**
 - 1.2 Detailed description of instruments within each policy landscape 6**
 - 1.3 Identification of interactions of instruments within each policy landscape.....20**
 - 1.4 Description and evaluation of policy landscapes in the light of the concept of optimality developed in task 1.122**
- 2 Description and initial evaluation of the overall instrument mix 25**
 - 2.1 Identification and description of the main interactions between policy landscapes.....25**
 - 2.2 Summary discussion of the combination of policy landscapes (the overall instrument mix) against each one of the elements of the concept of optimality26**
- 3 Conclusions 28**
- 4 References 29**

0 Executive summary

The goal of this national report is to outline and evaluate optimality of the climate policy instrument mix in the Czech Republic. The instruments are classified into four policy landscapes and interactions within as well as among the landscapes are evaluated. The landscapes are shaped by few key instruments, namely EU-ETS as a landmark of the *climate pricing landscape*, feed-in tariffs (and green bonuses) in the *renewable energy promotion landscape*, and energy taxes and energy savings subsidies in *energy efficiency and energy consumption landscape*. The two instruments attributed to *non-CO₂ greenhouse gas emissions landscape* do not seem to be of major importance. In total, we elaborate on 15 instruments in detail; for each of them we summarize its history, working, effectiveness and outlook.

In our analysis of interactions we first discuss overlaps of objectives, i.e. synergies and conflicts between greenhouse gas emission reduction targets (set at EU level), renewables deployment targets (national goals) and energy efficiency targets (also set at national level) to find a potential clash.

In particular, we identify ambiguous interaction directly affecting the energy sector, stemming from interplay between carbon pricing and renewable energy promotion. Increasing renewable energy installed capacity and production with low marginal production costs partly substitute peak electricity from coal (or natural gas) thus mitigating demand for emission allowances and contributing to general overall surplus. Cheap allowances tend to benefit operation of dirtier, but already depreciated, fossil-fuelled power plants to the detriment of both local air quality and climate policy goals, and increase uncertainty of investment climate in energy sector.

Our evaluation of optimality – based on rather scattered evidence – suggests that neither individual instruments nor their mixes within each of the landscapes provide a desired combination of effectiveness and efficiency. This could be ascribed to multitude of goals pursued, shared sovereignty between national and EU bodies, and limited ex-ante and ex-post evaluation of instruments' performance. In addition, we identify frequent legislative changes, mutual incoherence of settings and often the lack of clearly defined objective(s) as factors that compromise acceptability in the general public and predictability and stability sought by the business community.

I Description of policy landscapes

I.1 Classification of the instruments previously selected into policy landscapes

The objective of this report (and report series) is to perform an initial 'stock-take' of the climate policy instrument mix at the EU-Level and a representative group of Member States – the United Kingdom, Germany, France, Spain, Italy, the Netherlands, Poland and the Czech Republic. An initial list of up to 50 instruments from each country and EU-level was created, from which up to 15 key instruments for each state covering a broad selection of the economy, instrument type and objectives were selected for further analysis. Please refer to the

Taxonomy of Instruments, developed under Task 1.1 of CECILIA 2050, for a full description of instrument classification. For each report, the selected instruments were categorised into policy ‘landscapes’, described below.

- (1) **Carbon Pricing:** this includes policies that price CO₂ emissions or otherwise change the relative prices of fuel use, depending on the carbon intensities of fuels. Apart from the obvious candidates (carbon taxes and emissions trading) this would also include the reform or removal of fossil fuel subsidies;
- (2) **Energy Efficiency and Energy Consumption:** this includes measures targeted at either increasing the efficiency of the energy sector, including power generation / combustion processes, transmission of energy (heat, electricity) and end-use efficiency, or at reducing overall energy consumption (demand-side management, energy saving, sufficiency);
- (3) **Promotion of Renewable Sources of Energy:** this includes policies aimed at increasing the share of energy from renewable sources (solar, wind, hydro, biomass, geothermal);
- (4) **Non-Carbon Dioxide Greenhouse Gases:** this covers policies geared at reducing non-CO₂ greenhouse gas emissions, typically from sectors other than the energy sector. It may include emissions like methane emissions from landfills or animal husbandry, N₂O emissions from agriculture, or greenhouse gas emissions from chemical industries (SF₆, NF₃, HFC etc.)

The list of instruments for the Czech Republic, along with their landscape classifications may be seen in Table 1, below. This report describes each instrument based on a set of tabulated information found in Annex 1, and an attempt at assessing their individual ‘optimality’, based on the concept developed for use in the CECILIA 2050 project in Task 1.1, is provided. Descriptions of interactions between instruments within each landscape are also provided, based on tables found in Annex 2. The categories and methods of interaction are based on best practice in instrument interaction assessment, and are completed in pairs against a single key instrument, or when important interactions between non-key instruments are present.

The resulting optimality of each landscape based on instruments and their interaction are then assessed, followed by interactions between each landscape and, finally, an analysis of the optimality of the climate policy mix as a whole in each country and at the EU-level is provided.

As will be shown later in the report there is a lack of overall steering and coherence in the national climate policy. It is in part an outcome of limited importance paid to this issue by the current government. This is epitomized in the state of affairs regarding the governmental climate policy – even though the draft national Climate Protection Policy was already prepared in 2009, the final version was never adopted and the latest deadline for the final text submission to the government was yet again postponed to Fall 2013.

Table 1 – Classification of policy instruments into policy landscapes

Policy Instrument	policy landscape			
	Carbon Pricing	Energy Efficiency and Energy Consumption	Promotion of Renewable Sources of Energy	Non-Carbon Dioxide Gases

EU Emission Trading System (EU-ETS)	✓	(✓)	(✓)	✓
Excise Tax on Mineral Oils	(✓)	✓		
Tax on Electricity	(✓)	✓	(✓)	
Tax on Natural Gas	(✓)	✓		
Tax on Solid Fuels	(✓)	✓		
Reduced Excise Tax for Biofuels			✓	
Elimination of Partial Excise Tax Refund for Mineral Oils Used in Agriculture		✓		
Biofuel Obligation			✓	
Renewable Electricity Feed-In Tariff			✓	
Premium for Electricity from Renewable Sources			✓	
(Air) Pollution Fees				✓
Green Savings Programme	(✓)	✓	(✓)	
Energy Labels	(✓)	✓		
Coal Mining Limits		✓		
Reduced VAT Rate on Heat and Cold		✓		

Note: ticks in brackets denote instrument “overlapping” into particular policy landscape, but are described under their “primary” landscape.

1.2 Detailed description of instruments within each policy landscape

1.2.1 Carbon Pricing

The key instrument of this landscape is EU-wide emission trading system. Energy taxes, Green Savings Programme and energy labels, partly overlapping into this landscape, are detailed in energy efficiency / energy consumption subsection.

1.2.1.1 EU Emission Trading System (EU-ETS)

The scheme is an EU-wide emission trading system designed as a cap-and-trade scheme for greenhouse gases (mostly CO₂). The main goal is to curb GHG emissions and serve as a means to fulfil Kyoto Protocol targets. The EU-ETS was introduced into Czech law as a national implementation of ETS Directive 2003/87/EC by Act no. 695/2004 Coll. effective from 2005 (replaced with Act no. 383/2012 Coll.). This new ETS law brings new rules for transition from allowance grandfathering to auctioning, effectively transposing revision of ETS Directive adopted as a part of EU Climate-Energy Package.

The EU-ETS has been adopted as a major instrument for combating GHG emissions from (mainly) major industrial sources. As a market-based instrument it should achieve the emission reduction in a cost-effective manner by setting a cap on emissions and leaving to market to define the price per unit of emission. According to the latest data available, 430 installations in the Czech Republic are subjected to ETS (national allocation plans granted allowances to 406 and 390 installations for 1st and 2nd period respectively), with the largest 10% responsible for 84% of CO₂ emissions covered.

The outlook for ETS is not completely clear for at least three reasons – (1) it covers only around 50% of total GHG emissions and there is no consensus on possible further extension, (2) currently, the excess of allowances hamper the ETS's effectiveness and the prospect of a response in the form of backloading of excess EUAs from early years of 3rd trading period is unclear, and (3) no post-Kyoto global agreement on global GHG emission reduction targets but at the same time allowed swap of Kyoto's CDM and JI projects' CERs and ERUs with EUAs.

The lessons from the 1st and 2nd trading periods give a rather mixed picture as national allocation of allowances turned out to be too generous – the over-allocation in the 1st trading period of about 15% in the Czech Republic (see e.g. Ščasný and Máca, 2009) but overall the CO₂ emissions from EU-ETS covered installations decreased by approximately 10% between 2005-2011 (EEA/CITL 2011 data). Due to over-allocation (e.g. EUA price fall in May 2006 in response to publication of verified 2005 emissions in PL and CZ), its efficiency was not really exploited, and even worse the public perception was rather negatively influenced by windfall profits gained by large firms (e.g. ČEZ). As to the liquidity of the market in EUAs, the market recorded 1560 transactions in 2011 amounting approximately to 106 million emission units according to data from national register (OTE, 2012).

The political discussion of EU-ETS introduction was mostly technical oriented (NAP drafting, administration issues), mainly as a consequence of the fact that ETS Directive was already agreed before Czech accession to the EU. In contrast, the CR was very reluctant to ETS Directive revision in 2008-9 and only accepted the changes upon granting special provisions contained in Art 10c of 2009/29/EC Directive (i.e. gradually decreasing grandfathering of allowances for power sector in exchange for investments in retrofits/clean technologies).

1.2.2 Energy Efficiency and Energy Consumption

This landscape is made up of energy taxes, energy labels, Green to Savings programme, coal mining limits and gradual elimination of mineral oil tax refund for agricultural works.

1.2.2.1 Excise Tax on Mineral Oils

Excise tax on mineral oils is one of the key budgetary revenues in fiscal terms. The general principle is that the tax is levied upon all energy products that are intended for use, offered for sale or used as propellants (except for those that are subject to tax on natural gas or tax on solid fuels), while enumerated energy products used for heating are subject to the tax and energy products used for other purposes are in most cases exempted.

Originally the tax was introduced with a general tax reform in 1992 (replacing sales tax), The current excise tax act was adopted in 2003 in the process of EU acquis transposition. One of the major changes was a transfer of the tax administration from Financial to Customs

Administration. The transposition of Energy Taxation Directive 2003/96/EC was accomplished in 2005.

Excise tax on mineral oils is a part of general tax system securing substantial income to state budget. The tax is collected by Custom Administration upon release of energy products from tax warehouse for use as propellants or for heating. The total revenues raised amounted to CZK 80.9 billion¹ in 2011, and according to Eurostat (2012) transport fuel taxes account for 2% of Czech GDP, being the single most important of all the environmental taxes (representing 2.4% of GDP in total).

The role of the tax is mostly viewed from macroeconomic (fiscal) perspective and in this respect it serves its purpose as the demand for motor fuels is relatively inelastic. Short-term price elasticity for motor fuels was estimated around -0.5 for households (Ščasný and Brůha, 2005). The share of administrative costs of collection was estimated at 0.97% of the excise tax revenues in 2004 (Jílková et al., 2006). The official Customs Administration statistic reports the share of administrative costs of taxes they administer (primarily excise taxes, taxes on electricity, natural gas and solid fuels and VAT on imports) on tax revenues of 0.55% (MF, 2012).

From an environmental effectiveness perspective (disregarding tax exemptions, reductions and refunds discussed separately) neither tax rates currently applied on propellants and heating fuels nor EU minimum levels of energy products' taxation pursuant to Energy Taxation Directive are linked to the carbon content of energy products; in fact, the tax rates on diesel are lower than for petrol in spite of higher carbon content by volume. One of the options for streamlining - splitting the energy taxation into two components (carbon and energy) – has been proposed as a part of draft revision of the Energy Taxation Directive but the unanimity condition impedes a chance of adoption in the Council.

Currently road hauliers have been pressing the government to lower tax on diesel by CZK 1,400 per 1,000 litres so that the diesel prices become comparable to those in neighbouring countries (Poland in particular). In February 2013 the Ministry of Finance tabled in a proposal that mimics the two-tier energy taxation concept with the carbon component rate (applicable only to sector outside EU-ETS) set at EUR 15/tCO₂eq, but the proposal was not discussed any further.

1.2.2.2 Tax on Electricity

This is a new tax levied upon (end-user) consumption of electricity with tax rates set at very low unit rate per volume consumed. The electricity tax is calculated as the amount of electricity in MWh consumed and the tax rate is CZK 28.3 per MWh regardless whether the electricity is used for business or non-business purposes (including consumption in households). There are numerous exemptions put in place – foremost for renewable electricity – defined as electricity from solar, wind or geothermal origin, produced in hydroelectric installations, generated from biomass or from products originating from biomass, generated from methane emitted by abandoned coal-mines or generated in fuel cells. Tax exemption is also granted to electricity

¹ 1 EUR equals approximately to 25 CZK.

used for passenger and freight transport by rail, tramway and trolleybuses, for metallurgy and for electrolyses.

The tax was introduced in 2007 (effective from January 2008) in course of implementation of EC Energy Taxation Directive as a part of a fiscal stabilization package aimed at substantial reform of public finances (Act no. 261/2007 Coll., modifying 50 different laws). The tax rate was set only marginally above Community minimum levels. Originally, the introduction of the tax (and two other energy taxes discussed below) was intended to be compensated by lowering of social security contributions in an a stylized environmental tax reform, but in praxis the social security contribution reduction² was adopted a year later and also the fiscal neutrality was not fulfilled.

The tax administration (that is in part similar to excise taxes) is relatively efficient thanks to limited number of tax-payers. The relative administrative costs of energy taxes were estimated around 1.2% and compliance costs around 0.4% (Pavel and Vitek, 2010).

Tax revenues raised in 2011 amounted to CZK 1.4 billion. Ščasný and Brůha (2007) in their ex-ante assessment estimated virtually no reduction in consumption of electricity (-0.18%), a combined effect of low tax rate and low price elasticity (estimated as low as -0.2 for households). The low rate is also inefficient – if internalization of external costs of electricity generation is assumed as a secondary objective of the tax – as shown by Máca et al. (2012). In the similar vein, tax exemption granted for electricity of renewable origin provides limited advantage as a consequence of low tax rate.

The Czech Republic joined the EU only after EU Energy Taxation Directive adoption, and transitional period postponed the tax introduction until end of 2007. At that time it merged into broader effort to stabilize public finances in 2007 resulting in limited discussion on new energy taxes also due to the fact that these taxes were adopted at (almost) the lowest possible rates.

As for other energy taxes, changes may take place if the revision of the Energy Taxation Directive is adopted. No other plans for changes at national level were voiced as the electricity price is felt to be already too high in part due to failures in RES promotion (discussed below).

1.2.2.3 Tax on Natural Gas

Until 2007, the taxation of natural gas was a part of excise duty on mineral oils and except for use as propellant, a zero tax rate applied. The tax was reformed as a part of 'zero phase' of environmental tax reform. Tax exemption is granted to gas used for electricity production (as tax on electricity is levied on the output) and for high-efficient combined heat and power generation (here the electricity would only be taxed as output). Another exemption from the tax is granted for gas used for heating in households mainly to promote gas as less polluting alternative to coal (and also not to jeopardise previous investments in natural gas distribution networks).

The tax base is the amount of gas in MWh of gross heating value and the tax rates are set according to type of use, currently at CZK 34.2/MWh for use as propellant and at CZK 30.6/

² The SSC decreased from 26% to 25% in employer's part and from 8% to 6.5% in employee's part, at the same time the SCC assessment base ceiling has increased by almost CZK 100,000.

MWh for heating and industrial/commercial use (i.e. close to EU minimum level). In order to promote natural gas as an alternative automotive fuel there is a special tax reduction arrangement – until 2012 zero tax rate applied and in following years it will gradually rise up to CZK 264.8 per MWh in 2020. This tax reduction is a complementary measure to a voluntary agreement between government and gas industry on promotion of natural gas as motor fuel concluded in 2006.

Similarly to other energy taxes, the chance of restructuring of the tax to account for CO₂ content has been proposed in an amendment to Energy Taxation Directive but faces fierce opposition in the EU Council. The Czech government has already discussed (in mid-2012) a possibility of split carbon-energy tax introduction along with abolition of tax exemption for households from 2014. At the time of writing a proposal from the Ministry of Finance has been submitted to comments and faces a strong opposition from industry.

Tax revenues raised in 2011 amounted to CZK 1.3 billion. Ščasný and Brůha (2007) estimated reduction in consumption of natural gas by 7% (mainly due to relatively high price elasticities around -1). Similarly to tax on electricity the tax has a relatively effective administration with limited number of tax-payers and the compliance costs of tax payers were estimated at 0.27% (Pavel and Vitek, 2010).

1.2.2.4 Tax on Solid Fuels

The tax on solid fuels is an entirely new tax, until 2008 solid fuels were subject only to VAT. It was introduced together with taxes on electricity and natural gas as a national transposition of the Energy Taxation Directive. Originally, the tax was enacted as a part of environmental tax reform that should have been revenue neutral (i.e. by decreasing social security contribution), thus alleviating impact of the tax (mainly) on low-income households. Partly due to relatively low revenues, the neutrality principle was not fulfilled. According to explanatory memorandum to the tax law the tax should promote environmental objectives – resource and energy savings and emission reduction.

Enumeration of taxed commodities includes hard coal, lignite, briquettes, coke and other solid fuels used for heat production (or as propellants) by all end-users. The tax base is the amount of solid fuels in GJ of gross calorific value with single tax rate of EUR 0.334 per GJ. Tax exemption is granted for use of solid fuels in high efficient CHPs if the heat is delivered to households.

Ščasný and Brůha (2007) estimated reduction in consumption of solid fuels by 0.8% (i.e. 458 kt) on average (0-8% in different sectors) due to tax introduction; it was particularly limited in households as the authors' estimates of price elasticity is as low as -0.11.

Zimmermannová (2009) analysed impacts from new energy taxes introduced in 2007 using Leontief IO analysis and concludes that tax on solid fuels is the main driver of increased product prices, in particular in those sectors with a high consumption of solid fuels (mining, coke & refinery, electricity production), but the overall impact is limited as coke and electricity production are exempted from the tax.

A substantial increase of tax rate (approx. by 510%) reflecting carbon content has been proposed by Ministry of Finance in February 2013.

1.2.2.5 Elimination of Partial Excise Tax Refund for Mineral Oils Used in Agriculture

The partial tax refund for mineral oils used in agriculture is mostly viewed as a perverse incentive. It is currently granted to diesel or blended diesel (B30) used in crop production (incl. fruits, vegetables, viticulture, flowers etc.).

The tax refund was introduced in 2000 based on a joint initiative of the Ministry of Agriculture and Agrarian Chamber as a response to increasing excise tax on mineral oils rates introduced in 1999. The aim was to alleviate the tax burden on farmers compromising their competitiveness – according to a 1999 Green report on agriculture diesel consumption was higher per unit of crop output by 22% to 140% compared to German data (MZe, 2000). According to a subsequent 2010 Green report, diesel accounts for 60% of energy used in agriculture (the majority is used for crop cultivation).

The refund rate was for most of the time 60% (and 85% for B30 starting from 2004) of the full tax. Until 2008 the tax refund benefited also to some forestry activities but was cancelled for incompatibility with EC agricultural state aid guidelines. Pursuant to the 2012 amendment to Excise Tax Act the refund rate is lowered to 40% (diesel) and 57% (B30) of the tax for 2013 and tax refund is repealed effectively from 2014 as an austerity measure aimed to reduce the government deficit.

The amount of refund was CZK 1.8 billion in 2011 (and 1.7 billion in 2010), the refund for B30 accounts to about 1/3 of that amount. The tax refund is used by approximately 9,000 individuals and firms in agricultural business.

Some argue that abolition of the tax refund may in fact lead to higher use of biofuels in crop growing as the other tax exemptions (reduced rate for B30, exemption for B100, and refund for E85) will remain in place. National action plan for renewable energy sources (2010) already suggested abolition of diesel tax refund and promotion of higher use of biofuels in agriculture.

Agrarian Chamber has voiced strong opposition to proposed abolition of the refund during early summer of 2012. To cushion the protest the Government extended the tax refund to 2013.

1.2.2.6 Green Savings Programme

The Green Savings Programme has been a major energy savings and RES promotion programme for residential buildings sector (later expanded to cover public buildings) and an example of successful energy savings subsidy program for new or refurbished residential buildings with funding close to 1 billion euro. It subsidizes energy savings in heating (full or partial thermal insulation), construction of new houses to the passive energy standard, switch to renewable energy sources for heating and hot water preparation, and extra bonuses for combinations of measures.

The programme was started in 2009 with a budget initially funded from sale of excess Kyoto AUAs. The programme is administered by State Environmental Fund; individual subsidies are then approved by the minister of environment. Relatively strict and demanding requirements on project documentation and technical assessment, the need to use only enlisted

construction materials (product and technologies) and qualified suppliers slowed the submission of applications in the beginning of the programme, but once the rules were clarified a steady rise occurred and the total subsidy amount sought eventually exceeded available funding in September 2010 leading to suspension of the programme.

A revised 2nd phase of the programme has started in August 2013, but the aid intensity will be lower depending on heating energy savings – the subsidy will amount to 25% of eligible costs if at least 40% reduction is achieved, to 35% for (at least) 50% reduction, and to 50% for (at least) 60% reduction. The total funding for 2nd phase depends on revenues from EUAs auctioning (but additional sources are now sought for due to meagre revenues from sale of reserve EUAs).

As of 3Q2012 CZK 17.57 billion was paid from the programme (total allocation is CZK 20.8 billion). In total, 80 660 applications were administered (SFŽP, 2012). On average aid intensity was 67%. Estimated emission reduction from the programme is about 710 ktCO₂ per year; around 60% originating from energy savings and 40% from RES deployment. The most frequently subsidised activity is thermal insulation (56%), solar-thermal systems for heat water (17%) and biomass heating systems in new houses (10%).

The programme was initiated by Green Party's environmental minister Martin Bursík (in government in 2006-2009) in agreement with Japan Government (a major buyer of Czech surplus AUAs).

1.2.2.7 Energy Labelling of Household Appliances

Energy labelling (and provision of information on energy consumption) of household appliances is a mandatory award scheme directed at energy efficiency and (indirectly) on CO₂ emissions. Labelling obligation concerns appliances produced in large volumes for use in households, offices etc. Its main goal is to inform consumers on energy consumption of household appliances and encourage them to purchase more efficient units. It should also stimulate producers to innovate products' design to reduce their energy consumption.

Energy labelling is an important awareness measure that has evolved into relatively detailed labelling requirements for distributors/vendors and its compliance is supervised by state authorities. Recent revision updates labelling to energy efficiency progress and strives to improve its information capability.

Introduced in 2001 by the Energy Management Act, energy labelling became compulsory for washing machines, TVs, refrigerators, freezers, dishwashers, air-conditions, tumble dryers, electric ovens, light-emitters, combined washer-driers. The obligation setting mostly mimicked the existing EC laws and was repeatedly amended to comply with evolving EU rules.

According to the explanatory memorandum to the bill the macroeconomic importance lies in efficient use of energy and consequently lower consumption of primary energy sources and environmental impacts but no official quantification of these effects were published. Similarly, no data on cost-effectiveness are available at national level (note also the explanatory memorandum to the Energy Labelling Directive proposal seems to mostly focus on potential of environmental effectiveness and feasibility).

An evaluation of the MURE database³ assesses its impact as low and estimates annual energy savings in 2010 of about 1.353 PJ. A recent OECD study on household environmental behaviour found that Czechs have the highest reported installation rate of energy-efficiency-rated appliances (77%) in spite of relatively low levels of label recognition and use (71%) compared with other OECD countries (OECD, 2011).

According to State Energy Inspection (supervising the compliance of retailers) 36% of controls carried out in 2012 found breaches of proper energy labelling obligation. Most frequently these were smaller independent retailers that still are relatively uninformed about proper energy labelling according to the Inspection. In spite of relative smooth national implementation, recent extension of labelling (e.g. for tyres), closely related ban on classic light-bulb sale or energy performance of buildings were attacked by some critics as a “pure euro-bureaucracy”.

1.2.2.8 Reduced VAT on Energy-Efficient Heating and Cooling

Reduced VAT rate on heat and cold can be seen as a negative tax for environmentally friendly energy supply but some rather view it as a harmful subsidy. In this respect, it is claimed that reduced VAT rate promotes district heating for its substantial benefit in terms of energy efficiency. The Czech Republic has very extensive district heating systems coverage and the VAT reduction has primarily been adopted to avoid disruption of these systems when liberalisation of energy prices made district heating less attractive compared to competing heating options. A substantial part of district heating sector however needs upgrading to comply with Industrial Emission Directive and also remain competitive when faced with the need to purchase emission allowances (approx. 90% of households connected to district heating is served by installations subjected to EU-ETS).

The reduced VAT rate applies on heating (and cooling) delivered through district heating. Its main objective is promotion/preservation of district heating systems that deliver heat to some 1.5 million households in the Czech Republic (i.e. approx. 38% of all the households). This is not only the case of the Czech Republic (albeit in the largest extent) as Borselli et al. (2012) notes that reduced VAT rates for consumption related to housing (utilities such as heat being part of it) are much more important in new EU member states compared to EU-15.

Continuation of reduced VAT rate on district heating and cooling was stipulated during EU accession negotiation and originally Czech Republic was granted temporary exemption from 6th VAT Directive until end of 2007, prolonged until end of 2010 by VAT recast directive 2006/112/EC that later allowed (Article 102) for permanently reduced VAT on supply of district heating.

There are no plans to eliminate this reduced rate as this was one of the priorities in Czech negotiations on EU accession and this effort was accomplished in 2006 when Czech finance minister struck a deal with his Polish counterpart who withdrew his veto to the respective change in VAT Directive. Effectively, the reduced VAT rate – originally set to 5% were gradually increased to 9% in 2008, 10% in 2010, 14% in 2012 and to 15% from 2013, effectively narrowing the gap between reduced and standard VAT rates (21%). The revenues foregone from the reduced rate amounted to approximately CZK 1.4 billion in 2012.

³ <http://www.muredatabase.org>

District heating producers gradually upgrade their generators to combined heat and power generation and emphasize energy efficiency and environmental benefits. Approximately to 2/3 of district heating systems are now fed from combined heat and power generation with energy efficiency exceeding 60%. In exchange for grandfathered EUAs for 3rd trading period (worth approx. CZK 40 billion) substantial investments (around CZK 120 billion) in increased energy efficiency and environmental performance were stipulated by major heat and power sector players.

1.2.2.9 Coal Mining Limits

The mining limits are a command-and-control instrument aimed primarily at protecting municipalities and local communities in Northern Bohemia region heavily affected by unrestricted mining during recent decades (part of infamous Black Triangle). These land-use restrictions relate to surface mining of lignite (similar ones also exist for hard coal mining in Northern Moravia). The volume of coal beyond the limits at the two most promising locations – Bílina and ČSA coal mines – is estimated at 850 million tons and some predictions assume possible prolongation of mining beyond the year 2100.

Land-use restrictions for coal mining were set by Governmental Resolutions in 1991 as mandatory environmental limits for exploitation of coal-abundant but substantially environmentally degraded regions. Their legal nature is rather weak (as it binds on state administration only) and an attempt to transform them into generally binding law in 2008/9 failed. Due to reluctance of mining companies the coal reserves beyond the limits were not written off (as fundamentally required by mining law) and the preservation of limits became a persistent political issue with apparent lobbying from coal mining industry.

As a politically intricate issue no solid perspective can be drawn. Only recently, the Ministry of Industry and Trade in its revised State Resources Strategy suggested to open the discussion about partial abolition of the restrictions in 2016 and renewed State Energy Strategy aims at continuous use (i.e. in the 2040 time horizon) of coal primarily for combined heat and power generation (MPO, 2012a,b).

Brown coal is the only abundant fossil energy carrier in the Czech Republic and the energy security argument is often raised. It is estimated that more than 50% of total brown coal available for mining is blocked by the land-use restrictions. According to an unpublished study for Czech Coal (mining at ČSA coal mine) termination of mining by 2020 (i.e. keeping to the mining limits) would mean gross loss of about CZK 700 billion from public budgets perspective (including the loss of 8,000 jobs).

On the other hand the environmental impacts from use of this coal reserves were analysed by Melichar et al. (2012) who estimated external costs from electricity and heat generation from the coal beyond the stated limits. Using the ExternE methodology approach they quantified external costs from airborne emissions to be around CZK 445 billion (undiscounted) without accounting for climate change effects and around CZK 1,333 billion including climate change effects.

In the political arena, the traditional perception of brown coal as the major domestic energy resource playing a key role in electricity generation has recently been shifted in favour of importance of coal for district heating (or rather co-generation). According to revised State

Resources Strategy a set of measures aimed at efficient use of available coal (not affecting the limits), and substantial diversion from coal energy and promotion of alternative energy sources (RES, nuclear etc.) will postpone the need to abolish the limits until around 2035 (MPO, 2012b).

I.2.3 Promotion of Renewable Sources of Energy

This landscape consists of two coupled instruments promoting renewable electricity – feed-in tariff and green premiums (bonuses) as well as mandated minimum biofuel share in motor fuels market and excise tax breaks for biofuels.

I.2.3.1 Reduced Excise Tax for Biofuels

Excise tax exemptions, reductions and/or refunds for biofuels have a long tradition, in spite of relative instability – some of the changes were due to alignment to Community acquis, while others were taken in (mostly ineffective) effort to suppress tax frauds that were and still are relatively common (such as mixing untaxed biodiesel with conventional diesel or untaxed ethanol with conventional petrol).

Currently, the reduced excise tax rate is set for diesel blended with fatty acid methyl- or ethyl-esters (<30%, sometimes denoted as B30), excise tax exemption for pure biodiesel (meeting sustainability criteria prescribed by Renewable Energy Directive) and excise tax refund for ethanol (meeting sustainability criteria) contained in E85 blend.

The modern history dates back to mid-1990s, when biodiesel (first pure biodiesel, later 30% FAME blend, B30) was exempted from excise tax. In 2000 the exemption was abolished but in 2001 tax reduction for blended diesel (B30) was introduced. This reduction was retained in new excise tax law till 2006, and reintroduced again in 2008. Excise tax exemption for pure biodiesel was reintroduced in 2009. The tax refund of ethanol content in ethanol-petrol blends was originally introduced in 2004, abolished in 2006 and in restricted form (limited to E85) reintroduced in 2009.

In 2011 the excise tax reductions, exemptions and refunds for biofuels amounted to CZK 1.1 billion, of which tax reduction for B30 accounted for CZK 0.6 billion. Currently there are no solid plans for changes in tax benefits, but some concerns of state budget impact were already raised (along with argued redundancy vis-à-vis biofuel obligation) mainly in conjunction of the growing biofuel use leading to growth in foregone tax revenues.

Czech Republic failed to achieve the 2010 indicative target (5.75%) set by former EC Biofuels Directive but since then the biofuel market is on steady rise. The support scheme is however deemed as costly and benefiting mainly to a few big biofuel producers rather than to the environment or farmers.

Brůhová-Foltýnová and Máca (2009) assessed biofuels' support in the Czech Republic until 2006 and found mere excise tax exemption insufficient in promoting biofuels production. They also found increasing cost-effectiveness of support measures in spite of considerably high implicit total support per-tonne of biofuel. The authors note on the biofuel support between 1997 and 2006 that 'the entire system remained largely disparate, new changes were adopted without in-depth analyses of previous developments and lacked an overall objective'. Even

though the goal is nowadays clearer with EU targets and sustainability criteria, the rest of the quote is still valid.

1.2.3.2 Biofuel Obligation

The biofuel obligation is a key instrument targeting promotion of biofuels in line with RES Directive 2009/28/EC. It sets the minimum volumes of biofuels to be put on the market and leaves to the distributors various options how to achieve them.

It is a type of renewable standard portfolio that obliges motor fuel distributors to safeguard that the fuels they distribute contain a minimum quantity of biofuels. At present the law prescribes following minimum quantities (based on volumetric content): 4.1% for petrol and 6% for diesel. The distributors can satisfy this obligation by distributing blended fuels or pure biofuels (subject to compliance with fuel quality law); in all cases they are bound to prove the compliance with sustainability criteria.

The obligation was introduced into the Clean Air Act in 2007 with an increasing share starting from 2%. This was preceded with somewhat chaotic steps taken after a practical collapse of the support system for biodiesel that was incompatible with the EC acquis and was repealed in 2004 when the Czech Republic joined EU. In-between most biofuel production was exported (mainly to Germany and Austria). The biofuel portfolio standard was originally introduced to replace all other support schemes for biofuels and tax reductions/exemptions/refunds were consequently repealed from 2007 but some of these were reintroduced in 2008 and 2009.

Originally, a non-compliance penalty of CZK 75 per litre of the difference from minimum quota was set; in 2009 the penalty rate was lowered to CZK 40 per litre. The new Clean Air Act also introduces the sustainability criteria for the biofuels to qualify for the standard portfolio obligation. While the previous support schemes were mainly tailored to promote domestic production chains, but suffered from substantial instability, biofuel obligation sets relatively clearly the goal and seems to lead to market concentration and also to fulfilment of prescribed quotas (according to 2012 data).

From 2014 the volume based biofuel obligation will be replaced with obligation to reduce GHG emissions from motor fuels (by 2% in 2014, 4% by 2017 and 6% by 2020). The further outlook is strictly linked to evolvement of EU biofuel policy. New measures to account for indirect land use change as well as decreased support for first-generation biofuels are examples of such development.

Overall, biofuels are viewed as a costly means to curb carbon emissions – according to McKinsey study (2008) the costs per tonne of CO₂ avoided range from EUR 115 to 225. It is estimated that the fuel price has increased by a little due to biofuel additions (around CZK 0.5/litre for 6% FAME addition according to one of the major producers, PREOL). The domestic production of biodiesel (covering about 70% of domestic consumption in 2012) is based on rapeseed, while bioethanol is made from sugar beet, wheat and maize bringing (based on standardized GHG reduction values from RES Directive) 38% (biodiesel), 52%, 16-34% and 49% GHG reductions.

The system was set in operation relatively smoothly without major technical problems – most of the fuels sold are low volume blends (up to 7% of biodiesel or 5% of bioethanol addition to

conventional diesel and petrol respectively). In addition, niche markets for high volume (E85) or pure biofuels (B100) is slowly developing.

1.2.3.3 Renewable Electricity Feed-in Tariff

A national feed-in tariff scheme for promotion electricity of renewable origin aims at increasing the share of renewable sources in energy mix and contributing to achievement of Kyoto targets. It is also coupled with priority connection to transmission system (grid access obligation) imposed on transmission system operators.

The origin of Czech feed-in tariffs dates back to 2000 but was substantially revised by 2005 Act on promotion of renewable energy and again in 2012 with a new law that keeps two support options (feed-in tariff or 'green bonus', the next instrument discussed) but substantially tightens capacity limits for support and eligibility to feed-in tariff in particular (only for installations up to 100 kW of installed capacity).

The new RES law sets relatively strict criteria for eligibility to FIT. The maximum installed capacity limit is set to 100 kW (except for small hydropower with a limit of 10 MW). In addition specific limits are set for individual renewable sources. For photovoltaic (PV) the installed capacity limits is set at 30 kWp and only PV panels placed on building roofs or walls can qualify for support. For biogas it sets a limit that a maximum of 70% of the biomass used can originate from dedicated biomass grown on cropland or grassland, and at least 50% of biomass' primary energy should be effectively used (thus favouring combined heat and power generation). The FIT is now guaranteed for indicative lifetime set by Energy Regulation Office Decree to 20 years for most technologies, except for hydropower generators (30 years) and sewage gas fired plants (15 years). Also a cap on maximum FIT rate for any technology of CZK 4,500/MWh was set.

According to latest Energy Regulation Office statistics the share of renewable electricity on gross domestic consumption amounted to 10.5% in 2011 (in spite of the lowest electricity generation in large hydropower stations since 2004). Notably, electricity from PV increased 3.5 times from 2010.

The delayed response of Government (and Parliament) to sharply falling prices of PV panels in 2009-2010 and rigidity of the law allowing only 5% between-year decrease in guaranteed purchase prices lead to increase in installed PV capacity from 66 MWe by end of 2008 to 1820 MWe by end of 2010 when the purchase prices were substantially decreased (from CZK 12150/MWh to CZK 5500/MWh).

Following substantial changes of the scheme adopted between 2010 and 2012 the rapid growth of installed capacity (especially in PV) has slowed sharply and also renewed National Energy Strategy drafted by Ministry of Industry and Trade pursuant to RES Directive envisages mere 15% RES share on gross electricity consumption by 2040.

The recent revision of support scheme was mainly driven by increasing price of electricity, namely the electricity price part that covers costs related to promotion of electricity from renewable sources; it raised from CZK 166/MWh in 2010 to CZK 583/MWh in 2013; the total sum for 2013 is estimated around CZK 44 billion. The breakdown of these costs (based on 2011 data) shows that PV accounts for 68% of the costs but for mere 11.5% of the supported electricity in terms of electricity volume generated.

Current experiences are rather mixed as on the one hand the RES share on electricity generation has risen in the last years but on the other hand the costs associated are already deemed as too high (and also benefiting large players that invested in PV boom). The competitiveness concerns due to increasing electricity prices were already voiced and in part contributed to substantial tightening of the scheme. In addition, for the PV installations set in operation in 2009 and 2010 a windfall profit tax of 26% was imposed for three years (until 2013) and its extension is currently discussed. In early 2013 Ministry of Industry and Trade has suggested to cancel from 2014 on operational support for new renewable electricity generators (i.e. abolishing FIT and green premium schemes) and to replace it with targeted investment support for cost-effective and synergic installations. The respective bill is now in the Parliament and if adopted feed-in tariffs will not be available for virtually any new renewable electricity generators (i.e. with limited exception for small hydropower).

1.2.3.4 Premium for Electricity from Renewable Sources

The Green premium ('bonus') for electricity from renewable sources is an alternative to the feed-in tariff with slightly more market-oriented features. Unlike FIT the bonus does not guarantee purchase price (the electricity itself is sold on the market as any other – except for the guarantee of origin) but on the top of it the producer gets a bonus from OTE (energy market operator) set annually by Energy Regulation Office. Unlike FIT that should be calculated on predefined (15 years) cost recovery basis, the premium should at least reflect the difference between FIT price and expected average annual hourly price (of electricity). In addition, green premium is the only promotion option for electricity generated from both renewable and non-renewable sources (e.g. biomass co-firing).

The green premium was introduced in 2005 and originally it was designed as more 'risky' alternative to FIT as it did not guarantee the purchase of electricity on the market. The producers' decision between FIT and premium was in part driven by declared self-consumption (that was only accounted for under green premium). Following the new 2012 law the same cap as for FIT on maximum green premium rate of CZK 4,500/MWh applies and island systems are no longer supported.

The green premium provides a more flexible but less safe alternative to FITs. Unlike FIT purchasing prices, green premiums may be provided on annual or hourly basis. The premiums are now paid by OTE (previously by regional distributors who settled their balances on annual basis). The switch from FIT to green premium is possible only once a year and the two support schemes cannot be combined for a single installation.

No separate data for comparison of green premium and feed-in tariff were available at the time of writing of this chapter; all data referring to effectiveness, efficiency and outlook referred under FIT subchapter apply to green premium.

1.2.4 Non-Carbon Dioxide Greenhouse Gases

1.2.4.1 Air Pollution Fees

In a traditional classification of environmental taxes, air pollution fees are a type of pollution charges levied on direct emissions. They bind all polluters whose facilities surpass set thresholds (according to Register of emitting sources this encompasses approximately 16,000 installations). The pollution fees are set at unit values (per tonne) that are to increase substantially until 2021.

The pollution fees are due for emissions of four core pollutants - particulate matters, sulphur dioxide, nitrogen oxides, and volatile organic compounds (excluding methane). From 2013 the fees are levied only on large emitting sources (e.g. over 0.3 MW of thermal input for heat and power generation). It primarily aims at reducing emissions of classic pollutants, but most VOCs act as ozone precursors and, in addition, ancillary benefits from GHG reduction might occur (e.g. from fuel switch or increased energy efficiency).

Air pollution charges were among the first economic instruments introduced in the Czech Republic (or Czechoslovakia those days) in 1967. They were substantially reformed in 1992 and most recently in 2012. The last reform took in part account of various analyses showing very low effectiveness of the fees. According to new air pollution law only 4 polluting substances are charged (while before the reform 9 main pollutants and 2 pollutant classes were charged) and the fee is only due if it exceeds CZK 50,000 per year for a pollution source (before this threshold was CZK 500).

The new Air Protection Act increases the fee rates by around 50% for 2013 (i.e. CZK 4,200/t for particulates, CZK 1,350/t for SO₂, CZK 1,100/t for NO_x, and CZK 2,700/t for VOC) and from 2017 to 2021 a gradual increase in rates should follow (with about 4 times overall increase in rates). The revenues from the fees amounted to CZK 370 million in 2011 (i.e. prior the last reform).

The effectiveness of former setting were explored by Ritschelová et al. (2008) in their analysis of effects of environmental charges in CR, concluding that the share of air pollution fees on total revenues of firms subjected to these fees was almost invariably below 0.5%. The biggest payers recruit from two sectors – energy generation and metals production. In a scenario of 7-16 fold increase of the fee rates the share of air pollution fees on total revenues will stay below 1% for 97% of firms and for the remaining 3% of firms would fall between 1-5%.

Based on an empirical survey conducted in 2005, Jílková et al. (2006) show that administrative costs of air pollution fees for large emission sources amount to about 2.5-3% of revenues, but administrative costs of fee collection from medium-sized sources (e.g. combustion sources between 0.2 and 5 MW of thermal output) exceed revenues by more than 40%. This finding was later used in support for abolition of air pollution fees from medium and small sources. A very similar picture was also shown for compliance costs for firms indicating relatively fixed costs of fee administration and consequently high transaction costs of charging small- and medium-sized polluters.

The rates were shown not to match at all the external costs from respective emissions for representative Czech fossil-fuelled power plants by Máca et al. (2012). The environmental effectiveness of fees reform was analysed by Ščasný et al. (2009). They modelled substantial increases (14-40 times) in pollution fees for NO_x, SO₂, VOC and PM using macroeconomic model E3ME to find a potential for substantial reduction in emissions (SO₂ in particular), while only slightly increasing fuel prices (up to 1%) and only meagre overall impact (on GDP and employment) depending on means of revenue recycling.

In the parliamentary debate on the new Clean Air Act one of the options discussed was a complete abolition of the air pollution fees, the alternative one was a radical reduction in pollutants charged and substantial increase in rates and the latter option was later adopted (though in a slightly modified version).

I.3 Identification of interactions of instruments within each policy landscape

I.3.1 Carbon pricing

Objectives

There is only a limited interaction in this landscape as EU-ETS is the only instrument with carbon pricing as a primary objective. All remaining instruments overlapping into this landscape - energy taxes, energy labelling and Green Savings Programme – pursue other primary objectives. These are EU single market harmonization instruments in the case of energy taxes, and energy efficiency in case of energy labelling and energy savings (and promotion of renewable energy sources) in case of Green Savings Programme.

Scope and Coverage

This interaction is dominantly valid for indirect overlapping between EU-ETS and energy taxation, where a double burdening (regulation) argument is often mentioned. On the other hand, some view energy taxation in non-ETS sectors as an indirect carbon pricing.

A possible streamlining may be brought by splitting the tax into energy and carbon base (as proposed in draft revision of Energy Taxation Directive), but this would still pose difficulty in securing comparable carbon price all over the sectors inside and outside EU-ETS.

Functioning and Influencing Mechanisms

With EU-ETS as the only instrument with carbon pricing as its primary objective, it is for the most part exhibits a neutral relationship vis-à-vis other instruments in this domain. Its functioning is questioned as the stimulation signal given by mostly declining EUA prices is particularly weak and ineffective to induce transition to low-carbon economy.

Implementation Network/Administrative Infrastructure

No common administrative infrastructure exists for the instruments referred to in this landscape. A sectoral approach prevails and conflicts arise in situations such as deciding on emission allowances grandfathering or revenues recycling.

I.3.2 Energy Efficiency and Energy Consumption

Objectives

Only some of the instruments in this landscape have in fact energy efficiency and/or energy consumption as a stated (primary) objective, which also renders identification of the key instrument rather difficult. Energy taxation in particular suffers from unclear hierarchy of its secondary objectives, with revenue raising and tax harmonization generally deemed as its

primary objectives. Similarly, assignment (of elimination) of partial excise tax refund for mineral oils used in agriculture is motivated by its effects rather than explicit proclamation.

Scope and Coverage

The energy taxes (i.e. excise tax on mineral oils, tax on electricity, tax on natural gas and tax on solid fuels) tend to overlap with respect to target groups, but are mutually exclusive in terms of energy products coverage. Energy labels and Green Savings Programme are both (mostly) directed at households, and also partly overlaps to with energy performance certification of buildings adopted only recently.

Functioning and Influencing Mechanisms

There is likely a mutually supportive relationship between energy taxation and Green Savings Programme, and between energy taxation and energy labels. An indirect supportive relationship can be seen between coal mining limits and energy taxes in terms of influencing mechanisms on composition of energy sources.

A conflicting relationship between excise tax on mineral oils and partial excise tax refund for agricultural use will be resolved with tax refund elimination.

Implementation Network/Administrative Infrastructure

A common administrative infrastructure exists for energy taxes (carried out by Customs Administration), but the remaining instruments are promoted by different bodies under different ministries.

1.3.3 Promotion of Renewable Sources of Energy

Objectives

There is a clearly stated objective of promotion of RES in all the instruments assigned to this landscape, with (currently) key role played by feed-in tariff (and green premium as its alternative) in the electricity sector and biofuel portfolio standard obligation in the transport sector.

Scope and Coverage

The scope and coverage of instruments directly overlaps for target groups in two key domains – renewable electricity and transportation biofuels. Renewable heat is only relevant for the Green Savings Programme and in restricted scope for green bonuses.

There is clear overlap in scope of biofuel portfolio standard obligation and tax breaks for biofuels.

Functioning and Influencing Mechanisms

A supportive relationship can be seen in the coexistence of biofuel portfolio standard obligation and tax breaks for biofuels. The feed-in tariff and green premium coexist in a neutral way (as for most eligible RES-E producers a switch between the two is possible).

There is a competition for biomass and other production resources (e.g. rooftops) between renewable electricity and heat production and for cropland between crops for biofuels and food production. In addition, further limitations are introduced by sustainability criteria.

Implementation Network/Administrative Infrastructure

A common administrative infrastructure exists for biofuel portfolio standard obligation and tax breaks for biofuels; the same administration governs feed-in tariffs and its alternative, green premiums.

I.3.4 Non-Carbon Dioxide Gases

Objectives

The two instruments in this landscape – EU-ETS and air pollution fees – have a similar environmental objective, although its breadth differs.

Scope and Coverage

Both instruments directly overlap in terms of regulated sectors (with exceptions such as aviation); air pollution fees scope is however much broader, covering several thousand installations. The overlap in covered emissions is currently non-existent as VOC emissions are not included in EU-ETS at present and other non-CO₂ greenhouse gases are not charged by pollution fees.

Functioning and Influencing Mechanisms

Both instruments are market-based and in current setup their relationship is mainly neutral, partly due to poor effectiveness of the two instruments.

Implementation Network/Administrative Infrastructure

Administrative infrastructure is mostly different, although Ministry of Environment plays an important role in their implementation, the EU-ETS is to a large extent harmonized while pollution fees are an entirely nationally legislated instrument.

I.4 Description and evaluation of policy landscapes in the light of the concept of optimality developed in task I.1

I.4.1 Carbon Pricing

This policy landscape is mostly shaped by EU laws, primarily on EU Emission Trading System and rather indirectly by energy taxation harmonization. It is dominated by market-based instrument(s); with EU-ETS (as the only instrument targeting explicitly carbon emission reduction in the Czech Republic) being the central one.

It is somewhat difficult to evaluate this landscape mostly due to lacking governmental climate policy – a draft national Climate Protection Policy was prepared in 2009 but the Ministry of Environment keeps postponing its submission to the Government (the latest until Fall 2013).

While EU-ETS and its functioning is paid certain attention in the political arena, climate policy was a flagship of the Green Party during their governmental involvement in 2006-2009, but current government takes a rather reluctant stance (focusing more on energy issues as discussed below).

From an economic efficiency point of view EU-ETS, as a central measure of the landscape, does not live up to initial expectations so far. Whilst its introduction was relatively smooth, the price signal has been distorted by overly generous national allocation plans in most Central and Eastern EU Member States, offsets (i.e. using certified emission reductions under Kyoto Protocol), and economic slowdown.

The interplay between EU-ETS and energy taxation is not a major issue (unlike RES feed-in tariff as discussed below) as taxes on energy products used by production processes subjected to EU-ETS are set at minimum levels and benefit from various tax exemptions.

Energy taxes do not reflect carbon (or energy) content in their rates and consequently may only imperfectly substitute carbon pricing in non-ETS sectors. This will change only if a compromise on revision of Energy Taxation Directive is reached in EU legislation bodies.

From the feasibility point of view not many interactions can be detected as the instruments acting in this landscape are administered by different bodies, and to a large extent focus on divergent objectives.

1.4.2 Energy Efficiency and Energy Consumption

The policy landscape structured around energy efficiency and energy consumption encompasses a handful of instruments of different nature, scope, history and outlook, stretching from energy taxation via tax reductions and direct subsidies to labelling scheme and command-and-control measures. EU laws have shaped most of this landscape (i.e. national action plans drawn according to Energy Efficiency Directive), although particular features thereof are also significantly shaped by on-going discussions on future Czech energy policy, including the role of nuclear therein.

Energy taxes tend to overlap in terms of regulated subjects but very seldom in taxed commodities. A subsidy for agriculture diesel is likely in conflict with instruments targeted on rational energy use represented in particular by harmonized motor fuels taxation. Excise tax breaks for biofuels complement (overlap) with the biofuel obligation standard. A synergy can be identified among energy taxes, energy labels and Green Savings Programme in inducing (mostly) households to achieve energy savings.

Also certain interplay between tax on solid fuels and coal mining limits may be assumed as both instruments motivate the efficient use of coal. In a more general energy policy perspective the future energy mix and increase in reliance on nuclear power is being also discussed.

In terms of practical feasibility, no universal objective may be ascribed to the instruments in this landscape, although partially co-ordinated administration structure exists (e.g. for energy taxes). In some cases (e.g. coal mining limits) apparent ambiguity in the objectives pursued by different governmental bodies reduces instruments' strength and blurs their predictability and future prospects.

I.4.3 Promotion of Renewable Sources of Energy

The portfolio of instruments used for promotion of renewable energy sources includes feed-in tariff, biofuels portfolio standard and tax breaks in excise tax on mineral oils and tax on electricity. While the overall goal (13% RES share on total energy consumption by 2020) is set by EU laws, the particular instruments were set relatively autonomously.

The instruments promoting RES tend to induce competition for investments and particular resources such as biomass or rooftops. This is especially the case for biomass used for renewable heat and/or electricity production or co-firing in conventional boilers, as well as crops for biofuel or food production.

While renewable electricity is dominantly supported by feed-in tariff or alternative green bonuses, renewable heat may be supported by investment subsidies (e.g. from Green Savings Programme) or in restricted scope by direct operational aid.

From the environmental effectiveness point of view previous generous support schemes had on the one hand triggered massive increases in renewable electricity production capacity but on the other hand the increase was the highest in the most subsidized technology (PV), making only a little sense from economic efficiency perspective. Based on recently experienced extreme loads of Czech transmission network (used to transmit part of renewable electricity from northern to southern Germany), some concerns were echoed that further increase in renewable electricity production will necessitate more backup and network capacity; in a longer run this may be facilitated in wider deployment of smart-grids.

At present botched feed-in tariffs in 2009 and 2010 and their effects on electricity prices and competitiveness are one of most prominent topics discussed in media. In responding to this situation current government has taken several relatively draconian measures, effectively wiping out a steep rise in renewable electricity production capacity build-up. In addition to the (about to be proposed) phase out of feed-in tariff (tentatively effective from 2014), elimination of preferential taxation of biofuels, currently overlapping with biofuel portfolio standard, has been also suggested.

This landscape's political feasibility seems extremely difficult at present. The rigidity of 2005 RES Act and reluctance to act of the Parliament in particular (seen as a result of rent-seeking behaviour of some RES-E investors) in late 2009 has considerably damaged the image of RES promotion.

I.4.4 Non-Carbon Dioxide GHGs

This landscape entails around 14% of total GHG emissions (8% methane, 5% nitrous oxide and remaining 1% gases such as CFCs and SF₆) in the Czech Republic. The coverage of non-CO₂ greenhouse gas emissions in EU-ETS is currently relatively poor – only primary aluminium manufacturing, nitric, adipic and glyoxylic acid production out of the activities list subjects other than CO₂ emissions to EU-ETS allowances (perfluorocarbons in the former and nitrous oxide in the two remaining activities).

Air pollution fees are a traditional market-based instrument targeting inter alia non-CO₂ greenhouse gases emissions (volatile organic compounds as direct GHGs but mostly as ozone precursors) thus complementing EU-ETS in this landscape. The overlap is however

only partial, as the scope on pollution fees is much broader covering some 16 thousand entities (vs. 430 installations in EU-ETS). In terms of cost-effectiveness the recent recast of air pollution fees is seen as a positive step in motivating regulated entities and reducing administrative and compliance costs.

2 Description and initial evaluation of the overall instrument mix

2.1 Identification and description of the main interactions between policy landscapes

Policy landscapes' objectives aim not only at divergent targets but also at different levels. In particular climate policy and an overall GHG reduction goal is EU wide, unlike national targets for renewables and energy efficiency (although for renewables the overall target share is set by EU RES directive). Pursuing these objectives using relatively broad portfolios of instruments brings not only expected effects but also unwanted side effects that tend to compromise the effectiveness of individual instruments and their mixes.

With carbon pricing and emission trading as the core instrument thereof in mind one can infer that currently low prices of emission allowances do not show appropriate signals for an increase in both energy efficiency and renewable sources uptake. This *inter alia* materializes in likely cutbacks in available funding for the new Green Savings Programme as its tentative budget was originally based on predicted EUA prices above €10 (note that original Green Savings Programme was dominantly financed from Kyoto allowances sold before their market price collapsed). This interference may also work the other way round as achieving energy efficiency targets is likely to lead to reduced energy consumption and less demand for emission allowances.

Even more tangibly, the interaction between EU-ETS and renewable electricity support suggests three interlinkages. The so-called *merit order effect* of renewable electricity with very low marginal (operational) costs effectively displaces coal and natural gas as peak electricity thus decreasing both price and demand for emission allowances while favouring more RES deployment. Cheaper peak electricity may reduce pressure on energy savings; on the other hand electricity produced from renewable sources has lower or nil GHG emissions compared to its fossil counterpart. This interweaving is even more complex as the costs of renewable electricity support (feed-in tariffs and green bonuses) are an integral part of electricity prices, driving effectively, with increasing share of renewable electricity on the market, prices up. The overall effect is therefore likely positive (environmentally efficient) but most likely not cost-effective as merit order effect apparently jeopardizes EU-ETS working.

Were the EUA prices higher (and consequently electricity prices), the costs of renewable electricity support (relatively) decrease, with likely improvement in profitability of renewable electricity generation. In a similar fashion this holds also for renewable heat. Furthermore, higher EUA prices would increase demand for (co-)firing of biomass in thermal boilers to reduce costs for allowances needed for conventional fuels used.

Yet more complex interaction of instruments has been identified in combined heat and power generation that used to have and still holds a prominent position in the energy sector. With

reduced VAT, electricity tax exemption, green bonuses (or direct CHP support) and partially grandfathered emission allowances for the third EU-ETS trading period is by some viewed as petrification of large-scale district heating, effectively compromising decentralisation and diversification of energy production.

On the positive side energy efficiency improvements (and resulting reduction of overall consumption) help in attainment of targets for renewables. Nevertheless, it has been suggested that potential crowding-out effect on investments may be taking place between energy efficiency measures and renewable energy production. A decreasing price of renewable electricity may on the other hand weaken the push to energy efficiency goals. These two landscapes also compete for same public funding, e.g. in Green Savings Programme.

A positive interaction between energy consumption and promotion of renewables landscapes stems from coal mining limits and energy taxation as these render coal more expensive. In terms of effectiveness, the profound difference between the electricity tax exemption for renewable electricity and direct RES support (feed-in tariff/green premium) as it translates to electricity price is that the tax rate (i.e. tax break) is CZK 28.3 per MWh, while the RES support price amounts to CZK 583 per MWh in 2013.⁴

In a broader context, reductions in CO₂ emissions from energy and other industrial sectors as well as increased energy efficiency is often coupled with ancillary effects such as decrease in emissions of other pollutants (e.g. SO₂, NO_x or particulates).

In terms of implementation and administrative infrastructure there is a great deal of harmonization at EU level. In particular EU-ETS has been almost fully streamlined at EU level before the 3rd trading period started; but also minimum scope and rates for energy taxation, as well as features of energy labelling. On the contrary, virtually no coherence among national feed-in tariffs (or other RES schemes) exist which compromises effective operation of the electricity market.

There is a common administrative infrastructure for energy taxes and biofuel standard obligation and also for feed-in tariff and green bonuses; but for the remainder of instruments sectoral/departmental approach prevails.

2.2 Summary discussion of the combination of policy landscapes (the overall instrument mix) against each one of the elements of the concept of optimality

2.2.1 Environmental Effectiveness

The policy mix described in this report is relatively complex one comprising various market-based, command-and-control and information provision instruments. These have evolved over years sometimes into very technical and sophisticated forms quite distant from their original designs and purported (theoretical) functioning. This is particularly true for two major

⁴ The RES support includes also support for high efficient co-generation but its share is about 2% of the total.

instruments from carbon pricing and promotion of renewable energy landscapes, EU-ETS and feed-in tariff (plus green bonus). Their interaction is now often viewed as a political dilemma of the electricity market, i.e. whether to prioritize CO₂ reduction goal over promotion of renewables to stop cannibalizing the functioning of EU-ETS.

This interaction now affects electricity prices via costs of renewable electricity support to an extent that is felt as threatening the competitiveness of manufacturing industry – according to recent estimates RES support only costs industry 14% of its profit before taxation on average, and around 30% in certain energy-intensive sectors (steel, paper, heavy chemicals). On the other hand, this outcome effectively exerts additional pressure in energy efficiency / energy consumption landscape mostly substituting underutilized potential of taxes on electricity, solid fuels and natural gas.

2.2.2 Cost-effectiveness

The overall mix performs rather poorly from an (economic) effectiveness perspective, most markedly in promotion of renewable electricity as documented in photovoltaic boom in 2009-2010 that creates considerable burden in the form of guaranteed feed-in tariffs (or green premiums) over 20 year period.

In this respect the Energy Regulation Office has announced steps to terminate feed-in tariffs (and green premiums) from 2014 as their predictions show achievement of the RES goal for 2020; 13.5% renewable electricity already in 2013. The estimated costs of RES promotion with and without termination in 2014 are CZK 874 billion (over 2005-2034 period) and CZK 1,072 billion (over 2005-2040 period), respectively.

One of the features of the current situation is a substantial uncertainty about future proceeds from emission allowances auctions that in part are to be used for promotion energy savings and renewable heating in residential buildings.

2.2.3 Feasibility

As to the political feasibility factors, climate policy objectives were only a governmental priority during 2006-2009, when the Green Party was part of the coalition. While some of the instruments were simple transpositions of EU legislation (especially those adopted prior to the Czech Republic joined EU, such as EU-ETS), it was in 2005 when new Act on promotion of renewable electricity was adopted and in 2009 when the Green Savings Programme was launched.

From the feasibility and acceptability perspective, ex-ante evaluation of instruments' benefits and costs is only guessed rather than modelled - quantitative assessment in (regulatory) impact assessments usually takes the status-quo as the only alternative evaluated, in some cases restricted to stylized estimates of administrative and compliance costs, but even these are not regularly monitored (except for taxes). Frequent changes and amendments to laws are rarely thoroughly discussed and often modified during approval procedure in the Parliament and consequently lacking consistency and clarity. The complexity of some instruments also adds to low level of public understanding and acceptance and decision-makers tend to be

more prone to consult stakeholders such as energy utilities, professional associations and consultancies rather than the (mostly uninformed) general public.

3 Conclusions

This country report outlines and evaluates Czech climate policy instrument mix in four policy landscapes. The landscapes are shaped by a few key instruments, namely EU-ETS as a landmark of climate pricing landscape, feed-in tariffs (and green bonuses) in the renewable energy promotion landscape, energy taxes and energy savings subsidies in energy efficiency and energy consumption landscape. The two instruments attributed to non-CO₂ greenhouse gas emissions do not seem to be of major importance. In total, we elaborate on 15 instruments in detail; for each of them we summarize its history, working, effectiveness and outlook.

In our analysis of interactions we first discuss overlaps of objectives, i.e. synergies and conflicts between greenhouse gas emission reduction targets (set at EU level), renewables deployment targets (national goals) and energy efficiency targets (also set at national level) to find a potential clash.

In particular, we identify ambiguous interaction directly affecting the energy sector, stemming from interplay between carbon pricing and renewable energy promotion. Increasing renewable energy installed capacity and production with low marginal production costs partly substitute peak electricity from coal (or natural gas) thus mitigating demand for emission allowances and contributing to general overall surplus. Cheap allowances tend to benefit operation of dirtier, but already depreciated, fossil-fuelled power plants to the detriment of both local air quality and climate policy goals, and increase uncertainty of investment climate in energy sector.

Our evaluation of optimality – based on rather scattered evidence – suggests that neither individual instruments nor their mixes within each of the landscapes provide a desired combination of effectiveness and efficiency. This could be ascribed to multitude of goals pursued, shared sovereignty between national and EU bodies, and limited ex-ante and ex-post evaluation of instruments' performance. In addition, we identify frequent legislative changes, mutual incoherence of settings and often the lack of clearly defined objective(s) as factors that compromise acceptability in general public and predictability and stability sought by the business community.

4 References

- Brůhová-Foltýnová, H., & Máca, V. (2009). Successes and Failures of Bio-Fuels Promotion in the Czech Republic. In J. Cottrell, J. E. Milne, H. Ashiabor, L. A. Kreiser, & K. Deketelaere (Eds.), *Critical Issues in Environmental Taxation Volume VI: International and Comparative Perspectives*. Oxford: Oxford University Press.
- Jílková J., Pavel J., Vítek L., Slavík J.: *Poplatky k ochraně životního prostředí a jejich efektivnost*, Praha: Eurolex Bohemia, 2006.
- Máca, V., Melichar, J., & Ščasný, M. (2012). Internalization of External Costs of Energy Generation in Central and Eastern European Countries. *The Journal of Environment & Development*, 21(2), 181–197. doi:10.1177/1070496512442504
- McKinsey (2008) Náklady a potenciál snižování skleníkových plynů v České republice, Praha: McKinsey & Company.
- Melichar, Jan; Máca, Vojtěch; Ščasný, Milan (2012) Externí náklady prolomení limitů těžby na Mostecku: Příklad velkolomů Československé armády a Bílina. Praha: Centrum pro otázky životního prostředí UK v Praze.
- Ministry of Finance (2012) Zpráva o činnosti daňové a celní správy České republiky za rok 2011, Praha: Ministerstvo financí ČR.
- MPO (2012) Národní akční plán pro energii z obnovitelných zdrojů, Praha: Ministerstvo průmyslu a obchodu (srpen).
- MPO (2012a) Aktualizace Státní energetické koncepce České republiky, Praha: Ministerstvo průmyslu a obchodu (listopad).
- MPO (2012b) Surovinová politika České republiky, Praha: Ministerstvo průmyslu a obchodu (červenec).
- MZe (2000) Zpráva o stavu zemědělství ČR za rok 1999, Praha: Ministerstvo zemědělství ČR.
- MZe (2011) Zpráva o stavu zemědělství ČR za rok 2010, Praha: Ministerstvo zemědělství ČR.
- OECD. (2011). *Greening household behaviour the role of public policy*. Paris: Organisation for Economic Co-operation and Development.
- Pavel J., Vítek L. (2010). Administrative and Compliance Costs of Energy Taxes in the Czech Republic. In C. D. Soares, J. Milne, H. Ashiabor, K. Deketelaere, & L. Kreiser (Eds.), *Critical Issues in Environmental Taxation – Volume VIII Water Management and Climate Change* (pp. 536–553). Oxford: Oxford University Press.
- Ščasný M, J Brůha (2005) Analýza distribučních dopadů environmentální regulace, zpráva projektu VaV MŽP MŽP VaV 1C/4/43/04, Centrum pro otázky životního prostředí UK v Praze.
- Ščasný M, J Brůha (2007), „Predikce sociálních a ekonomických dopadů návrhu první fáze ekologické daňové reformy České republiky“ (Prediction of Social And Economic Impacts of the First Phase of Environmental Tax Reform in the Czech Republic), A study prepared for the Czech Ministry of the Environment. Charles University Environment Center, Prague, April 2007.

- Ščasný, M., & Máca, V. (2009). Market-Based Instruments in CEE Countries : Much Ado about Nothing. *Rivista di Politica Economica*, (July-September), 57–90.
- Ščasný, M., Píša, V., Pollit, H., & Chewpreecha, U. (2009). Analyzing Macroeconomic Effects of Environmental Taxation in the Czech Republic with the Econometric E3ME Model. *Czech Journal of Economics and Finance (Finance a uver)*, 59(5), 460–491.
- SFŽP (2012) Stav a zhodnocení programu Zelená úsporám, Státní fond životního prostředí ČR, November 2012, available from http://japatech.zelenausporam.cz/gallery/0/176-06_sfzp_stav_a_zhodnoceni_programu_zelena_usporam.pdf
- Zimmermannová, J. (2009). Dopady zdanění elektřiny, zemního plynu a pevných paliv na odvětví OKEČ v České republice. *Politická ekonomie*, 2009(2), 213–231.

Annex I: table for the description of instruments

	emission trading system	excise tax on mineral oils	tax on electricity	tax on natural gas
Instrument category	ETS	taxes	taxes	taxes
Instrument subcategory	cap-and-trade	Taxes on inputs or outputs of a production process	Taxes on inputs or outputs of a production process	Taxes on inputs or outputs of a production process
Level of governance	national	national	national	national
Degree of bindingness	binding	binding	binding	binding
Objectives	mitigation primary/other goals secondary	non-mitigation goals, with impacts on mitigation	non-mitigation goals, with impacts on mitigation	non-mitigation goals, with impacts on mitigation
Goal(s)	reducing GHG emissions in cost-effective manner	tax harmonization, revenue rising	tax harmonization, revenue rising	tax harmonization, revenue rising
Type of target	environmental	budgetary	budgetary	budgetary
GHG Scope				
GHGs covered	CO2, CH4, N2O, HFCs, PFCs, SF6 (effectively only CO2, N2O and PFCs)	NA	NA	(indirectly CO2, CH4)
Direct/indirect emissions	direct	NA	NA	NA
Primary/final energy	primary	primary energy	final	primary

Opt-in/opt-out	yes (opt-out limited in time)	no	no	no
Sectoral scope				
Sectors of economy	more than one	economy-wide	energy supply	economy-wide
Covered entities	mostly firms	registered taxpayers (tax warehouses, producers)	registered taxpayers (suppliers, distributors)	registered taxpayers (suppliers, distributors)
Covered sites	installations (fuel combustion, oil refinery, production of coke, metals chemicals, cement, glass, pulp and paper, CCS, aviation)	(tax warehouses)	NA	NA
Capacity thresholds entities/sites	thermal input exceeding 20 MW, specific thresholds for other production processes	import of untaxed oils	none	none
Opt-in/opt-out for sectors	opt-in	no	no	no
Opt-in/opt-out for entities	opt-in/opt-out	no	no	no
Opt-in/opt-out for sites	opt-out for small installations	no	no	no
Implementation network				
Competent bodies for adopting instrument	EU bodies (Council, parliament)	parliament	parliament	parliament
Competent body for setting-up instrument	parliament, government	parliament	parliament	parliament

Competent body to administer instrument	Ministry of Environment, Environment Inspectorate, Czech National Bank	Customs Administration	Customs Administration	Customs Administration
Competent body for registration of participating entities	Ministry of Environment, EC	Customs Administration	Customs Administration	Customs Administration
Competent body for Monitoring & verifying compliance	Environmental Inspectorate (compliance) Czech National Bank (auctioning)	Customs Administration	Customs Administration	Customs Administration
Competent body for enforcement of compliance	Environment Inspectorate	Customs Administration	Customs Administration	Customs Administration
Rules & influencing mechanisms				
<i>Market arrangements</i>				
Non-obligatory for eligible parties	no	no	no	no
Number of participants	approx. 430 installations (2011)	registered taxpayers: 589 (2011) registered distributors: 1065 (2011)	561 (2011)	548 (2011)
<i>Market flexibility</i>				
Trading	yes	no	no	no

Unit type and name	EU allowance (EUA)	volume (weight) of oils	volume of electricity	volume of gas in calorific value
Nature of unit	1 tCO2 equivalent	1000 litres (except HFO & LPG in tons)	MWh	MWh
Lifetime of unit	trading period (now 8 yrs)	NA	NA	NA
Banking provisions	yes	no	no	no
Borrowing provisions	yes	no	no	no
<i>Financing</i>				
Cost-recovery	no (at present)	no	no	no
Revenues raised	none (auctioning from 2013)	CZK 80.9 bil. (2011)	CZK 1.4 bil. (2011)	CZK 1.3 bil. (2011)
<i>Technological parameters</i>				
Eligible technologies	mostly industrial-scale CO2 emitting processes/technologies	NA	NA	NA
Opt-in/opt-out	yes	no	renewable electricity exempted	exemptions for gas for households, for electricity & CHP generation
Treatment of additionality	ERUs & CERs interchangeable for EUA up to a limit set by gov't	none	none	none
<i>Timing</i>				
Operational?	yes, from 2005	yes	yes, from 2008	yes, from 2008

Operational changes foreseen?	yes, from 2013	yes, LFO and HFO tax increase reflecting carbon content (2013 proposal)	no (pending ETD revision)	yes, tax increase reflecting carbon content (2013 proposal)
Compliance period(s)	2005-7, 2008-12, 2013-2020	month	month	month
Future continuation	third phase till 2020	yes	yes	yes
<i>Compliance</i>				
Monetary penalties	yes, EUR 100 per tonne of CO ₂ eq	yes, up to 10 mil. CZK	yes, up to CZK 200 000	yes, up to CZK 200 000
Naming and shaming	yes	limited	no	no
Administrative liability	yes	yes	yes	yes
Civil liability	no	no	no	no

	tax on solid fuels	reduced excise tax for biofuels	partial excise tax refund for mineral oils used in agriculture	obligation to ensure minimum biofuel content
Instrument category	taxes	taxes	Perverse incentives	Techsupport
Instrument subcategory	Taxes on inputs or outputs of a production process	Negative tax for environmentally-friendly activities	Removing negative taxes	Renewable portfolio standard
Level of governance	national	national	national	national
Degree of bindingness	binding	binding	voluntary (refunded upon request)	binding
Objectives	non-mitigation goals, with impacts on mitigation	mitigation secondary goal	non-mitigation goals	mitigation and other goals equally important
Goal(s)	tax harmonization, revenue rising	support for environmentally friendlier fuels	support to primary sector	climate policy, support to primary sector
Type of target	budgetary	environmental	competitiveness	environmental, social
GHG Scope				
GHGs covered	NA	NA	NA	CO2
Direct/indirect emissions	NA	(indirect)	NA	direct & indirect
Primary/final energy	primary (black coal, lignite, coke)	primary	primary	final

Opt-in/opt-out	no	no	NA	no
Sectoral scope				
Sectors of economy	energy supply	energy supply	Food and Agriculture	energy supply
Covered entities	registered taxpayers (suppliers)	registered taxpayers (tax warehouses, producers)	entities engaged in agricultural primary production	motor fuels distributors
Covered sites	NA	NA	all eligible	NA
Capacity thresholds entities/sites	none	none	none	no
Opt-in/opt-out for sectors	no	no	NA	no
Opt-in/opt-out for entities	no	no	no	no
Opt-in/opt-out for sites	no	no	no	no
Implementation network				
Competent bodies for adopting instrument	parliament	parliament	parliament	parliament
Competent body for setting-up instrument	parliament	parliament	parliament	parliament
Competent body to administer instrument	Customs Administration	Customs Administration	Customs Administration	Customs Administration
Competent body for registration of participating	Customs Administration	Customs Administration	Customs Administration	Customs Administration

entities				
Competent body for Monitoring & verifying compliance	Customs Administration	Customs Administration	Customs Administration	Customs Administration
Competent body for enforcement of compliance	Customs Administration	Customs Administration	Customs Administration	Customs Administration
Rules & influencing mechanisms				
<i>Market arrangements</i>				
Non-obligatory for eligible parties	no	no	yes	no
Number of participants	217 (2011)	(likely same as for excise tax)	approx. 9000 entities	registered distributors: 1065 (2011)
<i>Market flexibility</i>				
Trading	no	no	no	no
Unit type and name	volume of solid fuels in calorific value	volume (weight) of oils	volume (weight) of oils	minimum biofuel content (as % of total petrol & diesel volume)
Nature of unit	GJ	1000 litres	1000 litres	%
Lifetime of unit	NA	NA	NA	on a yearly basis
Banking provisions	no	no	no	yes (transferable to the next year, max. 0.2%)

Borrowing provisions	no	no	no	no
<i>Financing</i>				
Cost-recovery	no	no	no	no
Revenues raised	CZK 0.5 bil. (2011)	CZK -1 bil. (2011)	CZK -1.8 bil.	NA
<i>Technological parameters</i>				
Eligible technologies	NA	NA	crop production (incl. fruits, vegetables, viticulture, flowers etc.)	low volume addition, clean & blended biofuels
Opt-in/opt-out	exemption for fuels used for electricity and high-efficient CHP generation, coke production	no	NA	NA
Treatment of additionality	none	NA	NA	NA
<i>Timing</i>				
Operational?	yes, from 2008	yes	yes	yes
Operational changes foreseen?	yes, tax increase reflecting carbon content (2013 proposal)	no	yes	gradual increase
Compliance period(s)	month	month	month	year
Future continuation	yes	yes	to be abolished in 2014	yes

<i>Compliance</i>				
Monetary penalties	yes, up to CZK 200 000	yes	no	CZK 40 per litre below the threshold
Naming and shaming	no	no	no	no
Administrative liability	yes	yes	no	yes
Civil liability	no	no	no	no

	guaranteed price for electricity from renewable sources	green premium for electricity from renewable sources	(air) pollution fees	Green Savings Programme
Instrument category	Technical support	Technical support	taxes	Technical support
Instrument subcategory	Feed-in tariffs	Green certificates	Taxes directly applied to the pollution source	Policies to remove financial barriers to acquiring green technology
Level of governance	national	national	national	national
Degree of bindingness	binding	binding	binding	voluntary application (binding rules)
Objectives	mitigation primary/other goals secondary	mitigation primary/other goals secondary	non-mitigation goals	mitigation primary/other goals secondary
Goal(s)	climate policy, security of supply	climate policy, security of supply	air quality	climate, energy efficiency
Type of target	environmental	environmental	environmental	environmental
GHG Scope				
GHGs covered	CO2 (most directly)	CO2 (most directly)	none (SO2, PM, NOx, VOC)	CO2 (most directly)
Direct/indirect emissions	direct & indirect	direct & indirect	direct	direct & indirect
Primary/final energy	primary	primary	primary	final
Opt-in/opt-out	yes	yes	no	yes (?)
Sectoral scope				

Sectors of economy	energy supply	energy supply	more than one	Households, Consumer and Building
Covered entities	renewable electricity producers	renewable electricity producers	enlisted activities (energy, chemicals, metallurgy, waste etc.)	family and multiple-dwelling houses owners and builders; public building
Covered sites	all eligible	all eligible	all meeting set criteria	all meeting set criteria
Capacity thresholds entities/sites	water up to 10 MW and other sources up to 100 kW; biogas - max 70% from dedicated biomass grown on cropland or grassland;	solar up to 30 kWp biogas - max 70% from dedicated biomass grown on cropland or grassland	various thresholds: heat&power - thermal input over 0.3 MW	eligible measures: energy savings (insulation) & installation of RES heating - biomass, heat-pumps, solar etc.
Opt-in/opt-out for sectors	NA	NA	no	NA
Opt-in/opt-out for entities	NA	NA	no	NA
Opt-in/opt-out for sites	NA	NA	no	NA
Implementation network				
Competent bodies for adopting instrument	parliament	parliament	parliament	MoE
Competent body for setting-up instrument	Energy Regulation Office	Energy Regulation Office	parliament	MoE
Competent body to administer instrument	OTE (electricity and gas market operator)	OTE (electricity and gas market operator)	Regional Authorities	State Environmental Fund

Competent body for registration of participating entities	Energy Regulation Office	Energy Regulation Office	NA	State Environmental Fund
Competent body for Monitoring & verifying compliance	State Energy Inspection	State Energy Inspection	Customs Administration	State Environmental Fund
Competent body for enforcement of compliance	State Energy Inspection	State Energy Inspection	Customs Administration	State Environmental Fund
Rules & influencing mechanisms				
<i>Market arrangements</i>				
Non-obligatory for eligible parties	yes	yes	no	yes
Number of participants	total no. of installations: 14924 (2011)	total no. of installations: 14924 (2011)	total no. of installations: 16000 (REZZO 1, 2011)	approx. 80 thousand applications (3Q2012)
<i>Market flexibility</i>				
Trading	no	yes (of electricity)	no	no
Unit type and name	volume of electricity	volume of electricity	weight of emissions	(project)
Nature of unit	MWh	MWh	1 ton	eligible costs
Lifetime of unit	hour	hour	on a yearly basis	per project

Banking provisions	no	no	no	no
Borrowing provisions	no	no	no	no
<i>Financing</i>				
Cost-recovery	yes (15 yrs)	yes (but not guaranteed)		no
Revenues raised	NA	NA	CZK 340 mil. (REZZO 1, 2011)	granted aid of about CZK 21 bil.
<i>Technological parameters</i>				
Eligible technologies	energy from wind, solar, geothermal, water, biomass, biogas, soil, sludge gas, air	energy from wind, solar, geothermal, water, biomass, biogas, soil, sludge gas, air	major stationary emission sources	energy savings (insulation) & installation of RES heating - biomass, heat-pumps, solar etc. Combination of measures
Opt-in/opt-out			NA	NA
Treatment of additionality	NA	NA	NA	increased aid intensity
<i>Timing</i>				
Operational?	yes	yes	yes	2009-2012
Operational changes foreseen?	from 2013	from 2013	from 2013	2nd phase about to start
Compliance period(s)	3 months	3 months	year	set individually
Future continuation	yes	yes	yes	yes

<i>Compliance</i>				
Monetary penalties	0.1% daily of illegal support gained	0.1% daily of illegal support gained	yes, up to CZK 0.5 mil.	(subsidy withdrawal)
Naming and shaming	no	no	no	no
Administrative liability	yes	yes	yes	yes
Civil liability	no	no	no	no

	energy labels	coal mining limits	reduced VAT rate on heat and cold
Instrument category	Information	Command-and-Control	Taxes
Instrument subcategory	Award schemes	Land use planning, zoning	negative tax for environmental friendly goods/services
Level of governance	national	national	national
Degree of bindingness	binding	binding	binding
Objectives	mitigation and other goals equally important	protection of local communities, resources conservation	energy savings
Goal(s)	climate, energy efficiency	citizens protection, natural resources conservation, energy security	support of central heating systems
Type of target	environmental	social and environmental	mixed environmental and energy
GHG Scope			
GHGs covered	CO2 (most directly)	CO2 (most directly)	none
Direct/indirect emissions	direct & indirect	direct & indirect	(indirect)
Primary/final energy	final	primary	final
Opt-in/opt-out	no	NA	NA

Sectoral scope			
Sectors of economy	more than one	mining	energy supply
Covered entities	distributors	mining companies, energy producers	heat (and cold) suppliers
Covered sites	retail	several sites in NW Bohemia and N Moravia	CHPs and heat generators
Capacity thresholds entities/sites	NA	NA	district heating
Opt-in/opt-out for sectors	no	NA	no
Opt-in/opt-out for entities	no	NA	no
Opt-in/opt-out for sites	no	NA	no
Implementation network			
Competent bodies for adopting instrument	parliament	parliament, government	parliament, EU bodies
Competent body for setting-up instrument	Ministry of Industry and Trade	government	parliament
Competent body to administer instrument	Ministry of Industry and Trade	government	Ministry of Finance
Competent body for registration of participating entities	NA	NA	NA

Competent body for Monitoring & verifying compliance	State Energy Inspection	NA	Finance Administration
Competent body for enforcement of compliance	State Energy Inspection	Czech Mining Authority	Finance Administration
Rules & influencing mechanisms			
<i>Market arrangements</i>			
Non-obligatory for eligible parties	no	no	no
Number of participants	unknown (wholesalers/retailers)	3	653 (licensed heat suppliers)
<i>Market flexibility</i>			
Trading	no	no	no
Unit type and name	energy label	coal reserves	volume of heat
Nature of unit	product	NA	GJ
Lifetime of unit	product lifetime	NA	different
Banking provisions	NA	NA	no
Borrowing provisions	NA	NA	no
<i>Financing</i>			

Cost-recovery	no	NA	no
Revenues raised	NA	NA	(reduced VAT for delivery of approx. 400 PJ of heat per year)
<i>Technological parameters</i>			
Eligible technologies	washing machines, TVs, refrigerators, freezers, dishwashers, air-conditions, tumble dryers, electric ovens, light-emitters, combined washer-driers	NA	CHPs and heat generators
Opt-in/opt-out	no	NA	NA
Treatment of additionality	NA	NA	NA
<i>Timing</i>			
Operational?	yes	yes	yes
Operational changes foreseen?	no	partial relaxing of mining limits proposed in the renewed National Energy Strategy	no
Compliance period(s)	placing on the market	NA	NA
Future continuation	yes	yes (?)	yes
<i>Compliance</i>			

Monetary penalties	yes	NA	yes
Naming and shaming	limited	NA	no
Administrative liability	yes	yes	no
Civil liability	no	no	no

Annex II: Types of interactions between instruments

EU ETS – tax on electricity

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	both market-based
Degree of bindingness	m-m	both mandatory
Objectives	p-s	Partial overlap (CC mitigation objective)
Scope	p-pa	ETS participants often also tax payers
Implementation network	p-r	Both EU harmonized and adopted at national level
Rules and influencing mechanisms	-	(mostly different)

EU ETS – tax on natural gas

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	both market-based
Degree of bindingness	m-m	both mandatory
Objectives	p-s	Partial overlap (CC mitigation objective)
Scope	p-pa	ETS participants often also tax payers
Implementation network	p-r	Both EU harmonized and adopted at national level
Rules and influencing mechanisms	-	(mostly different)

EU ETS – tax on solid fuels

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	both market-based
Degree of bindingness	m-m	both mandatory
Objectives	p-s	Partial overlap (CC mitigation objective)
Scope	p-pa	ETS participants often also tax payers (though consumption for electricity generation and coke production are tax exempted)
Implementation network	p-r	Both EU harmonized and adopted at national level
Rules and influencing mechanisms	regulatory	(mostly different)

EU ETS – reduced VAT rate on heat and cold

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	both market-based
Degree of bindingness	m-m	both mandatory
Objectives	p-s	Limited overlap (environmental goal)
Scope	p-pa	Large district heat generation installations (or CHPs) in EU-ETS
Implementation network	p-r	Measures at national level
Rules and influencing mechanisms	-	(mostly different)

EU ETS – obligation to ensure minimum biofuel content

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	Portfolio standard vs. MBI
Degree of bindingness	m-m	Both mandatory
Objectives	p-p	Reduction in GHG emissions
Scope	p-r	Both EU induced; set at national level; different sectors
Implementation network	d-r	
Rules and influencing mechanisms	regulatory	Similarity in non-compliance penalty

EU ETS – air pollution fees

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	both market-based
Degree of bindingness	m-m	(thresholds, opt-out option in ETS)
Objectives	p-s	Mostly ancillary effects (e.g. fuel switch leading to change in emissions)
Scope	os-pa	ETS participants often also tax payers
Implementation network	p-r	Measures at national level; though EU-ETS driven from the EU
Rules and influencing mechanisms	-	(mostly different)

EU ETS – coal mining limits

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	market-based vs. Command & Control
Degree of bindingness	m-m	
Objectives	p-s	(broadly defined as environmental)
Scope	i-i	Potential use of coal by industries in ETS
Implementation network	p-r	(mostly different)
Rules and influencing mechanisms	regulatory	(completely different)

EU ETS – guaranteed price (green bonuses) for electricity from renewable sources

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	market-based vs. command-and-control
Degree of bindingness	m-v	
Objectives	p-p	GHG reduction vs. share of RES
Scope	i-i	Competing effects on electricity price (merit order etc.)
Implementation network	p-r	mostly different (Energy Market Operator acting in both)
Rules and influencing mechanisms	regulatory	(mostly different)

Obligation to ensure minimum biofuel content – reduced excise tax for biofuels

Table 2: types of interaction between instruments	Type of policy interaction	Description
Area of policy interaction		
Instrument type	different	Portfolio standard vs. negative tax
Degree of bindingness	m-m	
Objectives	p-p	Same
Scope	f-pa	Principally full overlap
Implementation network	f-r	Same (Customs Administration)
Rules and influencing mechanisms	regulatory	(mostly different)