Green Growth from the Viewpoint of the Czech Republic

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1. Introduction

After two decades of the dominance of sustainable development as the leading proclamation of many countries, something has changed after the 2007–2008 financial crisis and following economic recession. Growth became the catchword again. However, growth did not stand alone; it was merged with the "green" ideas. The wider concept was presented under different names, the first ideas were labelled as the Green economy (Gardner & Renner, 2008), another proclamation as the Green New Deal (Barbier, 2009; United Nations Environment Programme [UNEP], 2009), and later the term Green growth was adopted (Organization for Economic Co-operation and Development [OECD], 2011; World Bank, 2012). The EU presents a similar conception with the label Sustainable growth (European Commission [EC], 2012). The core ideas of these conceptions, hereafter collectively labelled as "green growth", aim to restart economic growth in an environmentally friendly and inclusive way. Green growth policies focus on renewable sources of energy, resource and energy efficiency, lowering environmental pressure in general (especially greenhouse gas emissions) and aim to lower poverty and inequality. In most of the conceptions, green growth is presented as a part of sustainable development (UNEP, 2011; OECD, 2011; World Bank, 2011). However, everyday politics and the economy usually differ from the proclamations, which could be refused, and even if they are implemented, the process can be very problematic. The aim of this study is to introduce the concept of green growth and show some positive and negative aspects of its implementation (or lack of implementation) in the Czech Republic. The chapter consists of a brief summary of selected international pro-environmental concepts, with special attention paid to the green growth; and of an overview of the situation in the Czech Republic, an EU member with experience in economic transformation in recent decades. The Czech case study builds on the report Green Growth Indicators (Hák, Sidorov, & Hájek, 2014) and discusses selected recent energy-related Czech policies and strategies, namely brown coal mining and photovoltaic electricity production. The chapter is desk study research,

analyzing data from public accessible sources, like international agreements and proclamations, governmental reports, statistical databases, research publications, and articles from the media.

2. The context of pro-environmental changes in economic policies

The goal of this sub-chapter is to present an overview of selected changes of economic thinking, declarations and policies which have occurred since the 1960s, a time of important political and social change in many countries. The late 1960s and 1970s also brought important changes in academic economics, though the new ideas did not affect a majority of scholars. First, the changes in theoretical economics, as well as the major ideas related to sustainable development will be presented. Second, we will introduce the idea of a green economy; and third, we will try to link it to previous academic and political concepts and declarations.

2.1. From Kenneth Boulding to Earth Summit

In 1966 US economist Kenneth Boulding published the text *The Economics of the Coming Spaceship Earth*, one of the first modern economic essays which discussed the limits of the economy given by physical laws (Boulding, 1966). In the early 1970s, transdisciplinary research, like the study of complex systems and dissipative structures (Prigogine, 1973), focus on a resilience of ecological systems (Holling, 1973) or an interest in entropy and the second law of thermodynamics (Georgescu-Roegen, 1971) also inspired the scholars who tried to connect economics with environmental issues. The book *The Limits to Growth* (Meadows, Meadows, Randers, & Behrens, 1972), which used computer models to suggest that population growth and an increasing consumption of resources can bring about serious negative consequences, gained popularity and criticism both from academic and political circles. Economists dealing with the environmental issues later split into two distinct branches, both formally rooted in professional associations. Environmental (and resource) economics, which is based in neoclassic economics, usually employs the concepts of externalities, market failure and the financial valuation of the environment to deal with the issues, such as pollution or amenities. This school of thought is represented by the *Association of Environmental and Resource Economists* and by William Nordhaus, Kerry Turner or David Pearce, to mention a few important figures. Ecological economists stress the carrying capacity of the biosphere, the ethical context of the economy and sustainability in a broader sense, sometimes using the concept of steady state economy (Daly, 1991). Some of the important persons in ecological economics are Herman Daly, Robert Costanza or Clive Spash of the organization called the *International Society*

for Ecological Economics.[1] When comparing the two above mentioned economic approaches, Cudlínová (2012) summarizes that environmental economics strives for optimal distribution and effective allocation of natural resources in society, while ecological economics searches for the ideal size of the economy, considering the Earth's carrying capacity.

In 1983, the *World Commission on Environment and Development* chaired by Gro Harlem Brundtland was established to re-think the relationship between environment and economic development. Four years later the commission issued the report known as *Our Common Future*, including the definition of sustainable development as meeting "the needs of the presents without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development [WCED], 1987, p. 41). The report interlinks three areas of sustainability: environmental, economic, and social. With only one or two of them fulfilled, the development process cannot be labelled as sustainable. The report is pro-growth especially in the least developed countries, however the quality of growth should be changed to become less energy- and material-intensive, especially in industrialized countries. But economic growth itself is not a solution for all problems; a more equitable redistribution of profit is needed as well. The report also includes the idea of how to deal with the fact that a significant part of the population is embedded in overconsumption: "Living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long-term sustainability. Yet many of us live beyond the world's ecological means, for instance in our patterns of energy use. Perceived needs are socially and culturally determined, and sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecologically possible and to which all can reasonably aspire" (WCED, 1987, p. 42).

The *United Nations Conference on Environment and Development* known as *Earth Summit* was held in Rio de Janeiro in 1992. As a follow-up to this event some international agreements and declarations were signed, including the UN Convention on Climate Change or Rio Declaration on Environment and Development. While the first officially recognizes dangerous anthropogenic climate change and leads to the Kyoto protocol, the more general latter, besides other things, stresses the precautionary approach: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" (UNEP, 1992, principle 15). As a consequence, the

[1] For more information on environmental and ecological economics see, Ropke (2004).

World Summit on Sustainable Development, which took place in Johannesburg in 2002, focused mostly on the implementation of *Agenda 21*, an action plan for sustainable development agreed upon at the Earth Summit in 1992. We can conclude by saying that during the 1990s and part of the first decade of the 21st century, sustainable development became the core policy principle (at least rhetorically) of many of the most developed countries, with the EU representing the avant-garde of its implementation.[2]

2.2. Green economy and green growth

We would like to briefly and chronologically summarize the existing definitions and proclamations of the green economy and green growth, including the ideas of the Green New Deal. Since there are some subtle differences between these concepts, they have some main common characteristics.[3] At the end of this part we will introduce a new theoretical academic approach labelled as green economics.

The term "green economy" was probably first coined in the report *Blueprint for a Green Economy* for UK Department of Environment in 1989 (Pearce, Markandya, & Barbier 1989). From today's point of view though, the report focused on sustainable development, not the green economy.

In 2005, the participants of The Fifth Ministerial Conference on the Environment and Development in Asia and the Pacific acknowledged the drawbacks of conventional economic growth and agreed on the importance of environmentally sustainable economic growth, in short green growth. Green growth should incorporate all three pillars (economic, social, and environmental) of sustainable development into the policies (United Nations Economic and Social Council [UNESC], 2005). Interestingly, the (mostly developing) countries literally expressed the effort to shift away from "grow first, clean up later" concept (UNESC, 2005, p. 45) and stressed the need for resource efficiency and environmental sustainability, and an understanding of environmental protection as an opportunity for economic growth and development.

In 2008 the book named *The Green Collar Economy* authored by Van Jones and Ariadne Conrad (2008) was published in US. However, the authors' understanding of the green economy differs slightly from those of the UN or OECD. Jones and Conrad define green collar jobs as "family-supporting, career-track job that directly contributes to preserving or enhancing environmental quality" (Jones & Conrad, 2008, p. 12) in fields like renewable energy production, the increasing of energy efficiency (especially of buildings), recycling, water management, local food production or public

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2 Of course not without some problems, as the Czech case illustrates.

3 See, e.g. Cudlínová (2014) for more information on green growth/economy.

transport. The authors call for the Green New Deal, which should lead to cleaner, greener and more equitable economy. The social context and the idea of poverty eradication are very important, as well as community engagement and a bottom-up approach, all of these being in the traditions of US grassroots civic activism (with government being a partner for the citizens and entrepreneurs, not the master). Contrary to some other green economy declarations, the authors are very critical about using crops for energy production (such as bioethanol).

The concept of the green economy gained prominence after the 2007 financial crisis, which turned into a global economic recession. In November 2008 the ideas on the green economy were presented to the G20 leaders at a summit in Washington D.C. Gary Gardner and Michael Renner (2008) argued, that the challenge for global leaders "is not merely to kickstart the global economy, but to do so in a way that creates jobs and stabilizes climate, increases food output using less water and pesticides, and generates prosperity with greater equality of incomes." The growth perspective had been rethought, the authors literally said, that the new approach "shifts the focus from growth to development" (Gardner & Renner 2008). They mentioned a UN call for a transformation of the economy and list some main principles of the Green New Deal, referring by title to Franklin D. Roosevelt's New Deal of the 1930s Great Depression: renewable energy, energy and material efficiency, green infrastructure, recycling and more equity.

In 2009 Edward B. Barbier prepared a report for the UN titled *Rethinking the Economic Recovery: A Global Green New Deal*, in which he presented three main objectives, including reviving the world economy (with special attention paid to job opportunities and vulnerable groups); reducing carbon dependency, ecosystem degradation and water scarcity; and ending extreme world poverty by 2015 (Barbier, 2009, p. 8). The objectives were adopted and elaborated by the UNEP (2009). Later, the UNEP defines the green economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2011, p. 1). Importantly, according to the UNEP the green economy does not replace sustainable development, the goal is just to switch from a "brown" economy (which produced economic growth but did not deal with social marginalization and resource depletion) to a green economy, able to deal with environmental and social problems. In the 2012 document, *The Future We Want*, a follow-up of *Rio+20 UN Conference on Sustainable Development*, the green economy was emphasized as a tool for achieving sustainable development (United Nations [UN], 2012).

In 2011, the OECD published the report *Towards Green Growth*, which outlines some crucial points of the green growth concept. It aims to foster "economic growth and development while ensuring that natural assets con-

tinue to provide the resources and environmental services on which our well-being relies" (OECD, 2011, p. 9), with an important link to poverty reduction. There is also an explicit warning about getting back to business as usual, which could cause many risks not only to the environment, but to further economic development as well. The growth should be reframed and much more attention must be paid to natural capital and its services, which are now undervalued. There is also a need for a better measurement of development and well-being, since the most widespread indicator, the Gross Domestic Product, cannot account for many environmental and social contexts.

According to the World Bank report *Inclusive Green Growth: The Pathway to Sustainable Development* (2012), there is an urgent need to stop unsustainable, inefficient and wasteful patterns of traditional economic growth and the greening of growth is a must. Green growth "is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters" (World Bank, 2012, p. 2). It is a vital tool for sustainable development, but it cannot substitute it itself (though sustainable development is not possible without green growth). Green growth is also presented as a chance to grow cleaner without growing slower. Green growth should be inclusive, however it is a question of policies and implementation, the idea of green growth is not inherently inclusive. The report also points to the globally high amount of subsidies for environmentally harmful economic activities.

The European Union presents its own version of growth policy, not labelled with the word "green" but similar. The EU 2020 strategy aims for the smart (linked with research and innovation), inclusive (lowering unemployment and poverty) and sustainable growth (European Commission [EC], 2014a). Sustainability of growth means environmental protection, new technologies, higher efficiency and it should lead to increased competitiveness (EC, 2012). In line with these strategies, the EU also promotes the concept labelled "bioeconomy", which should encompasses sustainable production of renewable resources from agriculture, forestry, fisheries and aquaculture, and other industries, which process biological resources (e.g. biological waste). According the EU (EC, n.d.), the strategy should increase competitiveness, enhance self-reliance and reduce the environmental footprint.

We can summarize that green growth[4] and green economy[5] are economic and development policies which focus on the renewable sources of energy, re-

[4] From this point on we use green growth as an overall umbrella for the summarized ideas.

[5] To make it a bit more complicated, it needs to be said, that there is also a theoretical academic approach labelled "green economics". Approximately ten years ago, an attempt to establish a new economic school of thought has started to increase the pluralism in current

source and energy efficiency, decrease of environmental pressure, lower carbon dependency, foster economic growth, lower inequality and decrease poverty. The emphasis on technological development and links between the decreasing of environmental pressure and increasing economic growth put green growth conceptions into the discourse of ecological modernization, an academic and policy approach which argues that the modernization of business and industry will lead to a better state of the environment (see, e.g. Hannigan, 2006, p. 25–28).[6]

Since the main purpose of this text is to introduce the concept of green growth and pay more attention to the Czech case study, we present only some of the examples of the critique of green growth. Wanner argues that the green growth/economy supports neo-liberal economic thinking and global capitalism, and is based on myths about decoupling (Wanner, 2014). Cudlínová (2012, 2014) challenges the green growth concept from the position of ecological economics and stresses the importance of planetary boundaries, which is neglected in the green growth concept. Santarius (2012) links techno-centered green growth with rebound effects and discusses various possible rebounds and their implications. Unmüssig, Sachs, and Fatheuer (2012) also stress the dominance of economy over society and environment in green growth concept and advocate diversity and social alternatives.

Despite the fact that almost every strategy of green growth includes sustainable development as the final goal, it seems that the idea of green growth is an attempt to stress the economic pillar of sustainable development and sideline the environmental pillar, respectively, the problem of global limits of resources and finite carrying capacity.

3. Czech case study

In this section, we present the Czech Republic as a case study for implementation of the green growth concept. We start with the introduction of the country, continue by presenting selected changes in environmental policy and participation in international agreements, we briefly cover the politi-

economic academia. This green economics is presented as holistic, multidisciplinary, long term and practical oriented discipline, which makes it different from most of the schools of economics. There are four key areas of interest for green economics: ecological/economic, intellectual, political and moral (Kennet & Heinemann, 2006). As the proponents of green economics claim it "builds on insights from environmental and ecological economics, feminist theory, welfare economics, development economics, post structuralism and post Keynesian ideas, but moves beyond them to create a discipline that seeks to nurture new alternatives based on inter-generational equity and social and environmental justice" (Kennet, Bouquet, Black, & Courea, 2011, p. 2).

6 Decades ago, ecological modernization had been criticized (see, e.g. Hannigan, 2006, p. 25–28) similarly as green growth is criticized now.

cal aspects of environmental and energy issues, present an overview Czech green growth indicators and discuss some of the important problems of environmental and energy policies in more detail.

3.1. The Czech Republic

The Czech Republic is a central european state with a population of 10.5 million people and an area of almost 79 thousand km^2 (thus having a population density of 133 people/km^2). It is located next to the German, Polish, Slovak and Austrian borders. The Czech Republic is a post-socialist liberal democratic parliamentary republic. The communist era in Czechoslovakia ended with the Velvet Revolution at the end of 1989, in 1993 the state split into two countries: the Czech Republic and Slovakia. In 1999 the Czech Republic became a member of NATO and in 2004 of the EU. The country went through a transformation and liberalization of its market, accompanied by the privatization of state-owned property and restitution of nationalized property.

The Gross Domestic Product (in PPP per capita) was 26,300 USD in 2013, which means 56th position out of 229 states (Central Intelligence Agency, n.d.). In 2012, the Human Development Index was 0.873, that is 28th ranking out of 187 countries (United Nations Development Program [UNDP], 2013).[7] Similar to many other countries, the Czech Republic was also influenced by the recent financial crisis and global economic downturn, see Table 1 for the data and comparison with some other central european states. After a peak in 2005–2007 and severe drop in 2009, economic growth was revitalized but in 2012 the economy again fell into recession. The International Monetary Fund's (2014) outlook predicts a 1.9% and 2.0% growth for 2014 and 2015 respectively. By mentioning the economic growth figures we want to illustrate the wider economic environment of Central Europe, we do not want to claim that growth revival was caused by green growth investment (to what extent it was is a question for another study).

Tab. 1. Real GDP annual change (in %)

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Czech Repubic	4.7	6.8	7.0	5.7	3.1	-4.5	2.5	1.8	-1.0
Austria	2.6	2.4	3.7	3.7	1.4	-3.8	1.8	2.8	0.9
Germany	1.2	0.7	3.7	3.3	1.1	-5.1	4.0	3.3	0.7
Hungary	4.8	4.0	3.9	0.1	0.9	-6.8	1.3	1.6	-1.7
Poland	5.3	3.6	6.2	6.8	5.1	1.6	4.1	4.5	2.0
Slovakia	5.1	6.7	8.3	10.5	5.8	-4.9	4.4	3.0	1.8
EU-27	2.6	2.2	3.4	3.2	0.4	-4.5	2.0	1.7	-0.4

Source: Eurostat (2014).

[7] When the HDI index is adjusted for in-state inequality, the Czech Republic express the lowest drop and in fact jumps in rank to the 14th position in the world (UNDP, 2013).

3.2. Milestones of environmental policies

After the political changes in 1989 two important trends occurred, which together lead to the improvement of many environmental indicators, especially water and air pollution.[8] First, the legislation of environmental protection improved. In 1992, the new Environmental Act (17/1992), Natural and Landscape Protection Act (114/1992) and Environmental Impact Assessment Act (244/1992) were introduced into legislative practice. The legislation was expanded in later decades, just to mention a few: the Waste Management Act (185/2001), the Water Act (254/2001) or Air Protection Act (201/2012). Second, the industry went through a transformation process (along with incorporating the country's market into the globalized economy), which caused a decline in many heavy and inefficient industries with high energy demand.

In the communist post-WWII era, the country's economy relied heavily on energy from brown coal (lignite) open pits in Northwest Bohemia, used for electricity production and heating for both industry and households. Such production caused serious environmental degradation and changed the socio-economic structure of the whole region due to the massive destruction of towns and villages and the movement of people (e.g. Glassheim, 2006; Říha *et al*. 2005). To change this approach, the government set "territorial ecological limits to lignite mining" for Northwest Bohemia in 1991 (Říha *et al*. 2005). This led to a slowdown of brown coal mining and changes in the structure of the domestic power supply occurred, with an increase in nuclear energy (and renewables in recent years). State environmental policies were relatively ambitious in the early 1990s, so was the relationship with emerging environmental NGOs. However, this became more complicated after the liberal government, led by the Civic Democrats in 1992, was formed.[9] At that time, neo-liberal prime minister (and subsequent president) Václav Klaus was such a strong opponent of environmental politics, climate change mitigation and the concept of sustainable development (Klaus, 2005), that the State Environmental Policy was refused three times by the government in 1995 and it was agreed upon only after omitting any reference to "sustainable development" (Fagin, 2000).[10] This ended with the fall of the liberal government in 1998.

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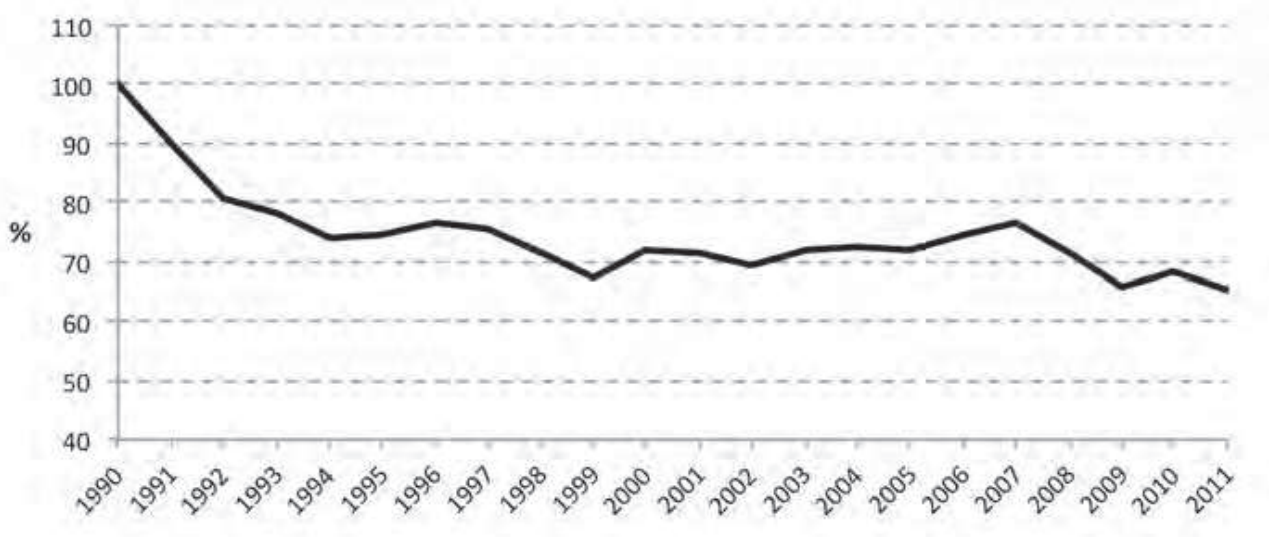
[8] However it should be said, that there are other ecologically negative trends in the Czech Republic, be it landscape fragmentation, increased car transportation exhaustion or the continuation of soil erosion.

[9] See, Fagin and Jehlička (1998) or Fagin (2000) for more information about the environmental politics and policies in 1990s.

[10] The fact that three leading environmental NGOs were listed as subversive organizations which had to be the target of surveillance in 1995 illustrates the governmental position towards environmentalism (Fagin, 2000).

The Czech Republic was one of the signatory countries of the United Nations Framework Conference on Climate Change in 1992 and of the Kyoto protocol in 1997 as well. The protocol was ratified by parliament in 2001. The Czech commitment to lower greenhouse gases emissions to 92 % of 1990 level in 2012 was accomplished. In 2011 the decrease of greenhouse gases emissions was 34.8 % (compared to 1990 level). Undoubtedly this is great success but the situation is a bit more complicated than it looks at first sight. As Figure 1 shows, the most important decrease occurred in early 1990s (due to the changes in industrial production and overall economic transformation). The 1990–1994 drop is 26 %, since then the annual levels of greenhouse gas emission fluctuate between the 65 and 74 % of the 1990 levels. The drops and peaks reflect the economic cycles (peak in 2006–2007, drops in 1999, 2009 and 2011 GDP turndowns). When broken into sectors, we can see a decrease of greenhouse gas emissions in commercial, industrial and residential sectors. The energy sector decreased in the early 1990s but returned to 1990 levels after 2000. What is unprecedented is the increase of the transport sector which in 2007 reached 250 % of the 1990 level, that means it more than doubled its emissions (EC, 2010). According to data of the Czech Ministry of Environment, the average greenhouse gases emission per capita was 12 tonnes of CO_2 equivalent (Ministerstvo životního prostředí, n.d.). This number can be considered very high when compared to the EU or the rest of world. In the post-Kyoto climate mitigation schemes, the Czech Republic is part of the EU 2020 climate and energy package which aims towards a 20% reduction of greenhouse gas emission compared to 1990 levels in the EU (EC, 2014b).

Fig. 1. Czech greenhouse gas emissions 1990–2011 (%)



Note: Including LULUCF (Land Use, Land Use Change and Forestry).
Source: Authors, based on data from Ministerstvo životního prostředí (n.d.).

Czech national policies of climate protection are being developed since late 1990s. In 1999 the government agreed on the *Strategy of Earth Climate System in the Czech Republic*, in 2004 it was followed by the *National Program to Abate the Climate Impacts in the Czech Republic*. New conceptions, the *Climate Protection Policy* and *Climate Adaptation Strategy* are now (October 2014) being prepared or already discussed by the government.[11] There are also strategies of sustainable development in the country. In 2003 the Government Council for Sustainable Development was established as an advisory body of the government. First, the *Sustainable Development Strategy of the Czech Republic* from 2004 was replaced by the new *Strategic Framework for Sustainable Development in the Czech Republic* in 2010.[12] Though the reality and implementation of the strategies is sometimes problematic (as elsewhere),[13] the sustainable development and climate mitigation rhetoric and proclamations became a relatively stable part of Czech policies in 2000s.[14]

After the 2010 elections, a new government dominated by two economically liberal parties (Civic Democrats and TOP 09) was established and governed the state until 2013. In reaction to the financial and economic problems in many EU states, the government stressed the importance of austerity, reviving growth and increasing competitiveness (by liberal reforms and cutting governmental expenditures). In some aspects, the change reminded one of the mid-1990s when environmental policies were perceived by the government as "icing on the cake", i.e. something, which can be done later when the economy will be stronger (see, Fagin, 2000).[15] The Ministry of Environment (specifically its head Tomáš Chalupa) has again been heavily criticized for various reasons: including, cutting grant funding for NGOs

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11 The previous *Climate Protection Policy* presented in 2009 was not agreed upon by the government.

12 See the website of the Ministry of Environment of the Czech Republic for links to these documents (http://www.mzp.cz/en/).

13 See Dlouhý and Dlouhá (2012) for some positive examples of implementation of sustainable development principles in the Czech Republic.

14 We do not want to be biased against any particular political party, however it seems not to be coincidental that none of the sustainable development or climate protection strategies was approved by the government dominated by the liberal Civic Democrats who co-governed the state for more than 11 years (half of the time since the establishment of the state in 1993). Contrarily, all of the strategies were approved by governments dominated by Social Democrats or by caretaker governments).

15 It is interesting, that Asian politicians decided to explicitly (verbally) refuse this idea ("grow first, clean up later") in their 2005 conference (see part 2.2 Green economy and green growth). It also seems that the downswing of economic growth hit not only Czech, but EU, officials very strongly. The emphasis on sustainable development almost disappeared and growth was again goal number one. Growth revival and competitiveness has taken absolute priority in 2009/2010 in official EU proclamations (Sokolíčková, Assenza, & Martynau, 2012).

(Ekolist, 2013), a restructuring which has led to a worsening of the activities of the department (Dlouhý, 2011), or no plans and activities towards the Rio+20 summit (Dlouhá, 2012).

3.3. Green growth in the Czech Republic

In fact, we can say only very little about green growth (as a political program) in the Czech Republic. In November 2009, the *Green Economy Ambassadors' Forum* was organized by the non-party affiliated Minister of Environment Ladislav Miko of the caretaker government with the participation of important "green economists" Edward B. Barbier or Pavan Sukhdev (Kašpar, 2009). The principles of green growth are also strongly presented in the program of the Green Party which also explicitly uses the term "Green economy" (Strana zelených, 2010). However, since 2010 the party is without representation in the Chamber of Deputies and is relatively marginal.

The rest of the actions were organized by academia or NGOs. In October 2010, the *Green Growth: Smart policies – Smart Technologies* conference was organized by the Heinrich Böll Foundation and Hnutí Duha – Friends of Earth Czech Republic (*Green Growth: Smart Policies – Smart Technologies*, 2010).[16] In December 2012, the *Green economy and Jobs in Czech Republic* conference was organized by Friedrich Ebert Stiftung and the labour organization KOVO (Friedrich Ebert Stiftung, 2012).[17]

Two reports monitoring the green growth indicators were issued since the concept gained some attention. Both were labelled as *Green Growth in the Czech Republic – Selected Indicators*, the first in 2011 (Havránek, Sidorov, 2011), the second in 2014 (Hák *et al.*, 2014). The authors summarized 27 indicators in five areas: i) socio-economic context, ii) environmental and resource productivity/intensity, iii) natural asset base, iv) environmental quality of life, and v) policies and economic opportunities. We very briefly mention some of the indicators to illustrate the state of and potential for green growth in the Czech Republic.

The important aspect of the socio-economic context is the inequality and poverty. The green growth report (Hák *et al.*, 2014) shows that the 2012 Gini index (level of income inequality) was 24.9 which represents one of the lowest inequalities in the OECD and EU. The Czech at-risk-of-poverty rate (including social transfers) was the lowest in the EU in 2012 (9.6 % of the population compared to the EU-28 average of 16.9 %). Labour productivity and life expectancy show different characteristics, both being below the EU-28 average.

Regarding environmental and resource productivity, the report (Hák *et al.*, 2014) indicates that since the mid-1990s there has been an increasing trend

[16] To be precise it should be said that the conference was under the auspices of environmental scientist and Member of the Senate Bedřich Moldan.

[17] Under the auspices of Head of the Senate Milan Štěch.

of energy productivity, greenhouse gas productivity, and material productivity, measured, i.e. energy consumption, greenhouse gases emission and material consumption compared to the country's GDP in real prices (with some negative effect of recent economic downturn). Nevertheless, the Czech economy still relies more on industry and coal based energy, thus productivity is below the OECD and EU average. In general, the increasing level of productivity suggests, that the process of decoupling economic profit and environmental pressure is to some extent successful. Apart from the concept of decoupling, there is another important concept in global environmental policy – displacement. The positive material balance of trade shows that the Czech Republic shifts the burden of material extraction to other countries. As the author of the reports suggest, due to this fact we can talk rather only about relative and local decoupling.

There are some positive aspects of the natural asset base, e.g. positive trends in forest growing stock (one of the highest among OECD countries) or a sustainable level of water abstraction. The amount of economic coal reserves decreased significantly in the last two decades, not only due to its extraction, but also due to the administrative limits and decisions put on open-pit brown coal mining in Northwest Bohemia (see above). The life span of lignite reserves (in 2009, based on that year's mining intensity) were estimated at 45, limited to only 33, considering the territorial limits. The report (Hák *et al.*, 2014) also shows that the Czech Republic is an ecological debtor (in terms of comparing the footprint and biocapacity), similar to most of the EU and OECD countries. There has been an increasing trend of the debt (caused by its increasing ecological footprint, the biocapacity is relatively stable) since 2000, and a large drop (from 5.85 to 4.85 global hectares per capita) between 2008 and 2009.

The environmental quality of life section of the report (Hák *et al.*, 2014) stresses some problems, mainly related to air quality. Considering air pollution, represented by particulate matter (PM) and polycyclic aromatic hydrocarbons (PAH), the situation is quite problematic. In 2011, the air pollution limits for particulate matter (PM10) were exceeded in an area containing one half of the country's population, the situation was even worse for polycyclic aromatic hydrocarbons (over 60 % of the population living in areas with excessive air pollution).

The last section of the report presents information on economic opportunities and policy responses. The authors point to the increasing trend in educational attainment in recent decades. The population with completed tertiary education is still below the OECD average (30 %), however it doubled in the last 16 years and reached 16 % in 2012. The number of green jobs[18] in

[18] A Green Job is defined as a "job that contributes substantially to preserving or restoring environmental quality" (Hák *et al.*, 2014, p. 55). The jobs are related to waste management,

the Czech Republic has been relatively stable in last years, albeit the overall economy experienced a drop in jobs due to the economic recession. Hence the relative share of jobs increased but it is still under the EU-15 average (1.3 % in the Czech Republic compared to approx. 2 % in the EU-15 in 2012). Most of the green jobs are in the waste management sector (Hák *et al.*, 2014).

The above mentioned data and trends provide a brief, but complex, picture of green growth state of affairs in the Czech Republic. There have been a lot of environmentally positive trends in the last 25 years of Czech history, but some problems remain and some new ones are emerging. Similarly, the international comparison shows that in some aspects the Czech state and economy can be considered as very eco-efficient and wise, while in others it is more problematic. Two recent cases of energy and environmental policies, which illustrate some of the current problems, are discussed in the following section.

3.4. Comments on selected indicators of green growth

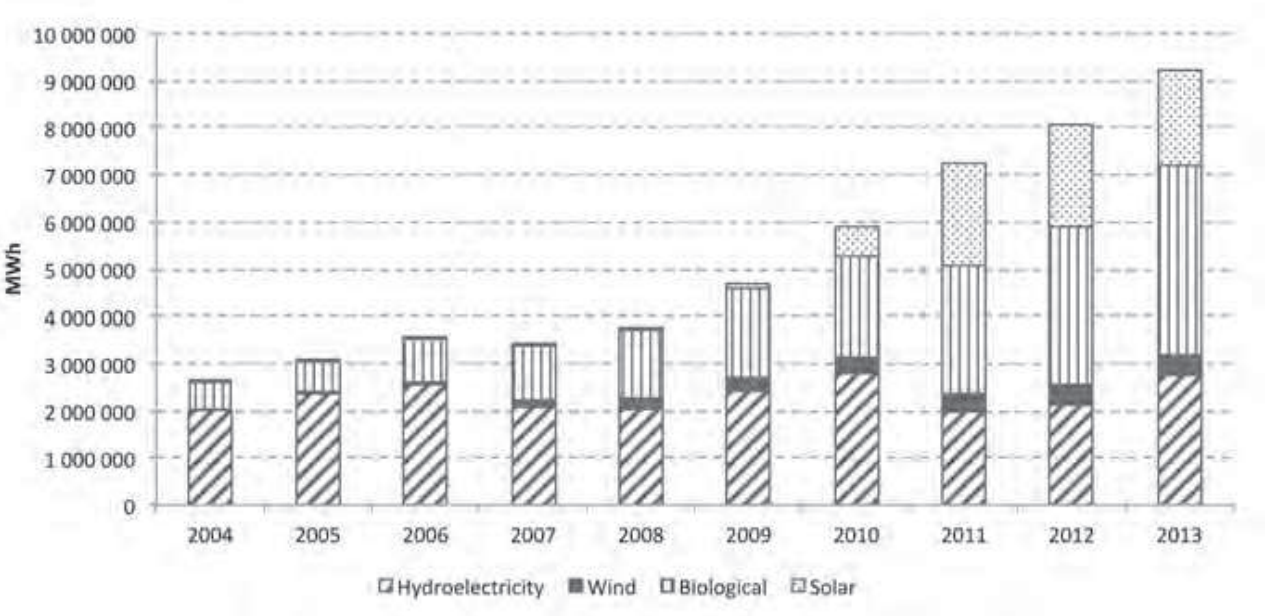
We would like to focus on some aspects of two examples of energy production (photovoltaic electricity and brown coal mining), since the energy-related questions are crucial parts of green growth, furthermore low carbon transition is important EU policy (EC, 2012). The Czech energy mix has been dominated by brown coal for many decades. The importance of this carbon intensive source has been moderately decreasing since the beginning of the 1990s. In 2009, of the total primary energy supply more than 40 % was provided by coal, 21 % oil, 16 % gas, 16 % nuclear energy and 6 % from renewables (Radziwill, 2012). In 2011, the Czech Republic reached 7 % of energy from renewable sources. The long term goal for 2020 was set to 13 % (Radziwill, 2012) and for 2030 it was set to 15 % of renewables (Hák *et al.*, 2014).

Considering the production of electricity, the situation is similar but more dynamic. In 2001, electricity-based on brown coal (lignite) made up 74 % of gross domestic production, in 2013 it was only 51 %. During these twelve years, the production of electricity in nuclear power plants increased from 20 to 35 %. The share of natural gas as a source of electricity rose from 3 to 6 % (Energetický regulační úřad, 2014). As the Czech study proves, energy policies are also area of interests of various social, political and economic groups and many conflicts appear.

materials recovery, landscape services, educational and administrative jobs related to environmental protection and other direct nature protection activities and management (ibid.).

3.4.1. Photovoltaic electricity production[19] The importance of renewable electricity sources has been increasing in last decade. The share of renewable electricity in gross domestic consumption increased from 4 % in 2004 to 13 % in 2013 (see Fig. 2). Production of electricity in photovoltaic (solar) power stations is the most dynamic sector of renewables. In 2008, these power stations produced 0.3 % of renewable electricity, in 2011 the share was 30 % (Energetický regulační úřad, 2014). Installed output of solar power stations was insignificant in 2008 (39.5 MW, i.e. 0.2 % of country's output). Two years later, in 2010, the output was 1,959 MW (9.8 %). Though, such boom can be considered as important step towards ambitious mitigation of greenhouse gases from strictly environmental point of view, it is more complicated in broader perspective.

Fig. 2. Renewable electricity production in the Czech Republic



Note: Category Biological consists of biomass, biogas and biodegradable waste.
Source: Authors, based on data from Energetický regulační úřad (2014).

Following the EU plan to increase the share of renewable energy (12 % of gross domestic consumption in 2010) the Czech parliament passed bill 180/2005 On the Promotion of Use of Renewable Resources (Sbírka zákonů, 2005). The legislation offered guaranteed feed-in-tariffs[20] for electricity producers for 15 years, to reach a 15-year repayment period. The Energy Regulatory Office, the institution responsible for setting the prices of feed-in-tariffs, was given only

[19] For more information on this topics see, Vávra (in press).

[20] Long-term guaranteed access to the grid and guaranteed price for the electricity provided by the producer and supplied to the grid.

limited authority to change the prices.[21] The feed-in-tariffs for solar power stations were higher (566 €/MWh in 2007[22]) than for other renewable energy sources to reflect the high investment. When the investment costs rapidly decreased (the price of solar panels dropped for 40 % in 2007–2009), mostly due to the boom of Chinese production (BDO Audit, 2012; Wile, 2013), the Energy Regulatory Office was not able to flexibly react. In 2009 and 2010 solar electricity attracted many investors and the installed output increased more than 50x. Though the Energy Regulatory Office pointed to the increasing discrepancy between investment costs and guaranteed feed-in-tariffs, the legislation was not changed to allow them to act more flexibly in 2009 or 2010 (BDO Audit, 2012; Energetický regulační úřad, 2013). The costs of the guaranteed tariffs are paid both by the consumers of electricity (households and industry) and the state budget. In 2010, some changes in legislation were made which limit the feed-in-tariffs for new solar power stations and also set the short-term retroactive tax on solar power stations constructed in 2009 and 2010. However, this tax could be opposed by some legal actions by investors (Radziwill, 2012). To sum up, the practical implementation of feed-in-tariffs for solar power stations was financially ineffective (Radziwill, 2012) and caused a lot of controversy about renewable sources in general. One of the outcomes is that in 2014, the subsidies for some sources of renewable energy have been lowered and there are no subsidies for new solar panels (Energetický regulační úřad, 2013; Vláda České republiky, 2013). Additionally, some of the cases of individual solar power plants have an almost criminal context – criminal charges, suspicious buy and sell, anonymous owners, police investigation, etc. (Bardsley, 2013; Česká tisková kancelář, 2013). The issue also raises the question (rather a question for police and attorneys), to what extent was the inefficient realization of the policy a mistake or a bad intention. This case documents, that the method of implementation is absolutely crucial. If the environmentally framed policies are accompanied by such problems, public trust not only of politicians and solar electricity producers, but of renewable energy (thus of green growth) and pro-environmental policies in general, can be undermined. In any case, the problem of solar power stations was used by some politicians also during the discussions about the State energy conception and territorial mining limits.

Other Central European countries also experienced a boom in the photovoltaic industry. The implementation and context of the subsidies differed in some cases. For example, in Germany, the increase of photovoltaic electricity production is part of the large-scale Energy Transition ("Energiewende" in

[21] The year-to-year change of the feed-in-tariff was limited only to 5 %. This means that the power station established in 2009 could only be given a 5 % lower tariff than a power station from 2008. Anyway, in both cases the given tariff was guaranteed for 15 years.

[22] Exchange rate 1 € = 27.5 CZK.

German) towards renewable sources and energy efficiency (Morris & Pehnt, 2014). The German case shows some significant characteristics. First, it is rooted in the society. More than half of the investment in renewables has been made by small investors; moreover 69 % of citizens support the energy transition (*Energy Transition – The German Energiewende*, n.d.). Second, German feed-in-tariffs for photovoltaics have smoothly decreased since 2004 (Bundesverband Solarwirtschaft, 2008; Fulton & Mellquist, 2011). No drastic changes in legislation or retroactivity are needed and the development of the market is more predictable.

3.4.2. Brown coal mining Since the complete privatization of the coal mining companies in Northwest Bohemia more than 10 years ago, the idea of abolishing the territorial brown coal mining limits appears from time to time among the politicians or in the media. Breaking the limits and enlargement of the mining pits would lead to the destruction of local settlements (one of them, the town of Horní Jiřetín with a population of over 2,000 inhabitants, is a symbol of resistance to the pits' enlargement). The discussion about the territorial mining limits started again, due to the new proposals of the State Energy Conception, and the Raw Material Policy (both 2012, neither of them was approved) presented by then Minister of Industry and Trade Martin Kuba (Civic Democrats). While the Energy Conception did not challenge the mining limits, the Raw Material Policy expected their abolishment (Barton, 2013). According to Hák *et al.* (2014), this would prolong the lifespan of brown coal in the area for 12 years (45 years without the limits, 33 with limits – both assessed in 2009). The support for breaking the limits was in 2013 also publicly expressed by the caretaker Prime Minister Jiří Rusnok and is repeatedly expressed by president Miloš Zeman, former Social Democrat. Pro-mining marketing campaigns paid by the mining companies also appear quite often in the region (Barton, 2013).

One of the original goals of the mining limits in the early 1990s was to offer enough time to the region to restructure its economy to lower its dependency on mining and related energy production. This is not a short and easy process and today's unemployment, GDP and environmental statistics show that the Ústí nad Labem Region suffers from many economic and social problems (Český statistický úřad, 2013). One may find it surprising that the politicians, and a not negligible part of the citizens of the region, believe that the solution to the current problems could be found in a prolongation of the trends which in fact caused many of them.[23] Abolishing the limits would in

[23] However, the recent opinion polls show that a majority of the inhabitants of the Ústí nad Labem Region prefer to maintain the mining limits and disagree with the destruction of the settlements due to further mining (STEM, 2010; Ipsos, 2014).

fact only postpone the transition to no-mining in the area for few years into the future. The possible answer to this question (apart from the increased lobbying of privately-owned mining companies) could lie in the post-WWII history of the region. When the Germans were expelled, the new regional identity (with many newcomers) was built on the mining and industry (Glassheim, 2006). For many local citizens and local politicians (many of them are ex-miners) the idea of a mining region seems as something good and natural, despite the serious environmental, social and some negative health consequences.

The debate about abolishing the mining limits is framed by the economic and energy discourse – jobs and energy security (e.g. Česká tisková kancelář, 2013; Kopecký, 2013). The environmental consequences, not to say responsibility for global consequences (greenhouse gas emission), are absolutely missing in the statements of a majority of politicians. However, there is also local political resistance by representatives of some towns (e.g. Horní Jiřetín, Litvínov) and NGOs, which bring the environmental context into the debate.

Apart from being a dominant resource for electricity production, brown coal is also important for heating, mostly for the central heating stations in towns and cities. One of the arguments used in the discussion says that if the mining limits will not be abolished there will be no coal for heating in the heating plants. This would potentially affect more than 1.5 million people (Klímová, 2008). Considering the fact that the Czech Republic is a net exporter of electricity with an increasing installed output of nuclear, natural gas and renewable power stations (Energetický regulační úřad, 2014), we find this argument very problematic and almost perverse. From the green growth perspective, brown coal is not only carbon intensive and an environmentally damaging source of energy, the additional enlargement of energy available can hinder the investment into low-carbon and more efficient technologies, not to say renewable sources of energy.

Similarly as in the case of photovoltaics, brown coal mining also appears in other central european countries, especially in Germany and Poland. In Germany, as well as in Poland, lignite (brown coal) supplies 12 % of gross domestic consumption of energy, while in the Czech Republic it is 30 % (2011 data in Eurostat, 2013). There are many debates about open pit mining in both of these countries and large public protests, too (Associated Press, 2014).

4. Conclusion

Green growth is definitely an ambitious concept on how to give impulse to the economy and try to overcome the negative environmental aspects of traditional fossil fuel-based and industrial economic growth. There are many possible problems and questions in the green growth concept itself

and many others can get in its way during the implementation process. We tried to illustrate it using the case of the Czech Republic. The country shows some strengths like very a low level of income inequality and at-risk-poverty rate, or a low level of water abstraction. There are also positive trends which include increasing the country's economic productivity measured as GDP compared to energy and material consumption or production of greenhouse gases. Some of the presented indicators are rather negative, be it the still high share of coal in energy production leading to high carbon and ecological footprint per capita, or air pollution.

We argue that another, probably crucial, threat lies in the lack of knowledge of or interest in the ideas of green growth (or even animosity towards these ideas). There is not any official strategy or plan for implementation of green growth in the Czech Republic. One can argue that the practical steps leading to the goals of green growth can be done even without such a strategy. However, the two presented examples, solar electricity boom and challenging the territorial limits of brown coal mining, illustrate recent anti-green growth trends in the state. In the first case, the legislative support for renewable energy helped to increase the share of electricity from solar panels, but the very problematic realization and low cost-effectiveness to some extent discredited the idea of renewable energy in general. The latter case represents persisting on such concepts of development which directly contradicts green growth (and sustainable development) and lacks any sense of global responsibility.

If there is something that the Czech Republic is really missing, it is a trust in institutions, politicians and elites. Unfortunately, the strange fusion of lack of economic rationality (solar boom) and overemphasizing short-term economic profits (brown coal mining), bad governance, possible behind-the-stage lobbying and clientelism definitely do not help to build the trust in any policies and institutions, including green growth ideas.

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