

5. ECONOMIC OPPORTUNITIES AND POLICY RESPONSES

The principal role of governments is to foster green growth by setting policy and the legal framework that allows individuals and companies to develop greener consumption and production patterns. The crucial issue is to use environmental protection as a stimulant of growth, employment and trade, as well as a source of international competitiveness.

Technological research, development and innovations are important for any economic growth and this applies to green growth as well. Technological progress is useful for developing greener production and consumption and for creating new jobs. Publicly funded research in particular is important here as it can focus on the mid- and long-term research horizons. Complementary to the technological development is the attainment of an appropriate education. Green growth requires well-educated workers able to meet the higher requirements for skilled jobs.

Investments in green technologies and environmental protection in general are a key element in reshaping the current growth paradigm for green growth. Environmental taxation with energy pricing is a direct tool for governments to stimulate growth in a particular way. In the case of the Czech Republic it is particularly true since environmental levies are part of the environmental fund used for green innovations, green job promotions and investment in the protection of the environment in general.

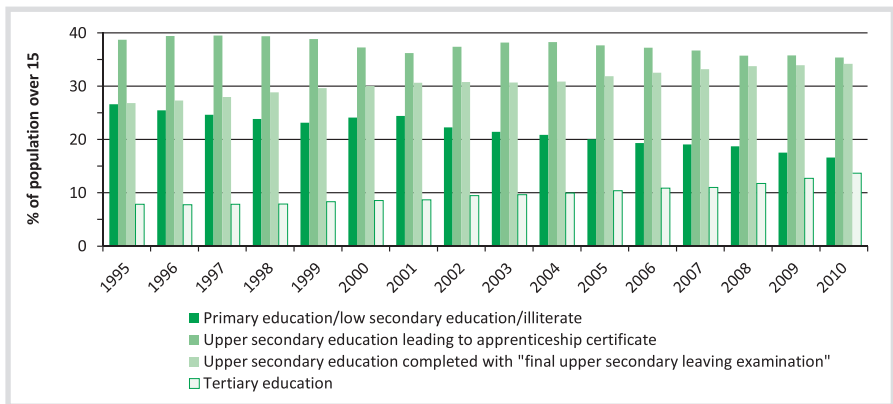


5.1. EDUCATIONAL ATTAINMENT: POPULATION OVER 15 YEARS

The educational attainment indicator measures the educational attainment of the adult population in terms of their successful completion of formal education programmes.

According to the OECD, education is an essential investment for long-term growth, developing the potential of nations and for responding to the fundamental changes in technology and demographics that are re-shaping labour markets. An upper secondary education serves as a foundation for advanced training opportunities, as well as a preparation for direct entry into the labour market. The high tertiary entry and participation rates help to ensure the development and maintenance of a highly educated population and labour force. People without upper secondary or tertiary qualification are likely to face difficulties when entering the labour market as well as in preserving their jobs. Educational attainment is therefore one of the crucial prerequisites for the green growth goals achievement.

Figure 23: Educational attainment: population over 15 years (%)



Source: Czech Statistical Office

The educational attainment in the upper secondary and tertiary education level of the Czech population has considerably increased since 1995. The share of people graduating from an upper secondary education completed with a "final upper secondary leaving examination" has increased from 26.8% to 34.2%, and the share of the population that has completed the tertiary level education has increased from 7.8% to 13.7%.

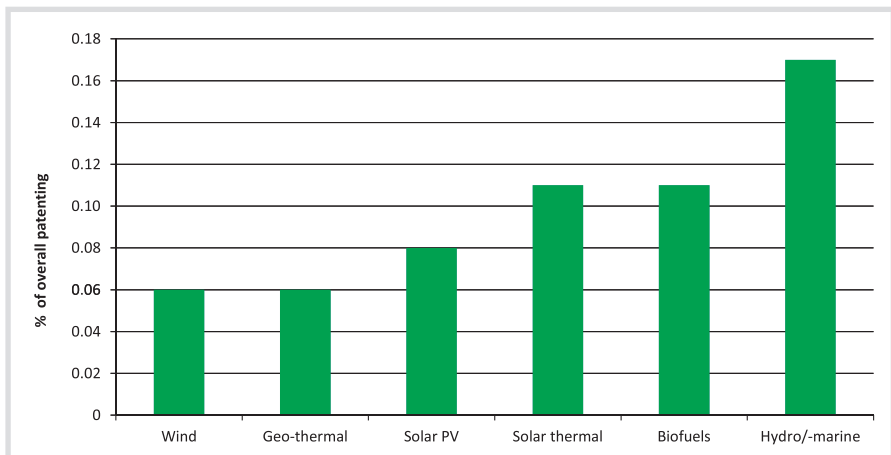
The Czech Republic has achieved an OECD above average share of the population over 15 years who have attained at least an upper secondary education. In contrast the percentage of the population that has attained a tertiary level education was considerably under the OECD average (about 14% compared with 27% on average in OECD countries) although the number of graduates has continued to increase. The other education-related indicator used by the OECD – illiteracy – of the Czech population is very low (under 1%).

5.2. GREEN PATENTS: SHARE OF CLEAN ENERGY TECHNOLOGIES

Share of clean energy technologies covers wind power, geothermal energy, solar photovoltaic, solar thermal energy, hydro energy and biomass related patent claims to an overall number of claimed patents. Patents are submitted by Czech applicants to the European Patent Office, the selection is based on the international patent classification code.

Share of clean energy technologies is used as a proxy indicator for green patents in the Czech Republic. Clean energy technologies are innovations that have the potential to contribute to climate change mitigation and are essential to green economic growth.

Figure 24: Percentage share of patenting in clean energy technologies field relative to patenting overall in the (%)



Source: European Patent Office

The percentage share of claimed priorities in each selected clean energy technologies sector in the Czech Republic compared with the overall number of claimed priorities in the Czech Republic is demonstrated by the period from 1988 to 2007 (average values). In this period, hydro patents reached the highest share of 0.17%, compared to the lowest share 0.06% of wind and geo-thermal energy share.

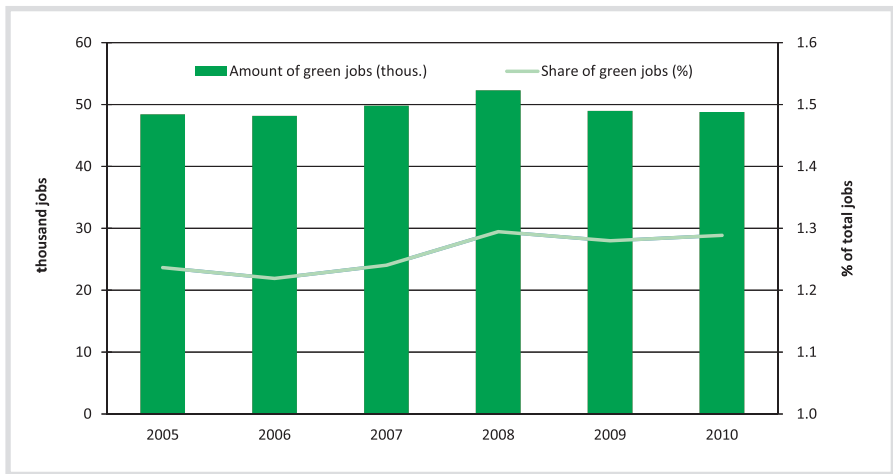
The share in selected clean energy technology fields is quite low in the Czech Republic compared to other OECD countries. Leading countries in the clean energy technologies patenting are Japan, the United States, and Germany. However, emerging economies (e.g. China) are showing specialisation in individual sectors, providing further competition in the field and potentially changing the future of the clean energy technologies patent landscape.

5.3. GREEN JOBS

The indicator for green jobs is composed of the number of employees that are working in enterprises and institutions producing services for environmental and natural resources protection (NACE CZ codes 2211, 37, 38, 39, 8130, 8411, 8559, 9104). This indicator does not include employees producing products used for resources and environment protection.

The impact of environmental policy on employment is ambiguous. On the one hand, environmental legislation creates new job opportunities contributing to the improvement of the environmental state at the same time. On the other hand one can think about the negative consequences related to phasing out less environmental friendly industries and structural unemployment related to these processes. However, the positive role of green jobs in the modern society is indisputable.

Figure 25: Green jobs (thous.) and their share of total employees (%)



Source: Czech Statistical Office

Between 2005 and 2010 the number of green jobs reached its maximum in 2008 mirroring the development trend of employment as a whole in the Czech economy. However, the subsequent development of these indicators was different. Despite the economic crisis the number of green jobs in 2010 exceeded the number of green jobs in 2005 (+0.8%) whereas the whole economy recorded a decrease in the number of employees (-3.3%).

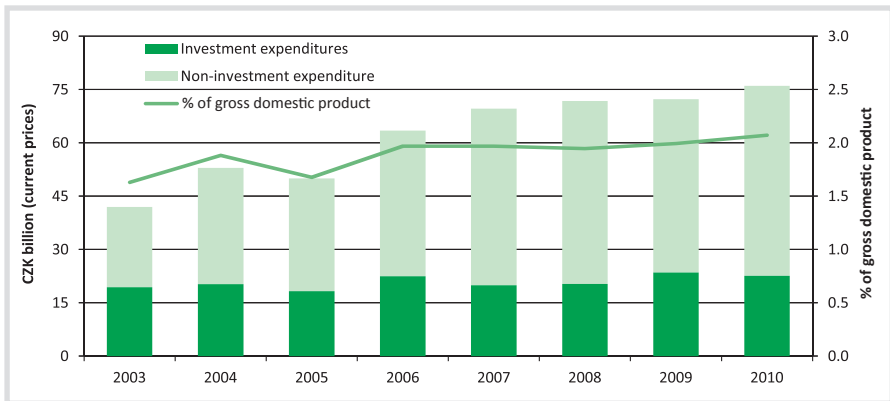
The largest number of green jobs in the Czech Republic is concentrated in waste collection, treatment and disposal activities (51.7%). Compared to other developed countries, the Czech Republic still has a smaller share of green jobs than the average (2% for EU 15). One should mention, however, that these share figures may be influenced by different definitions of the "green job" category.

5.4. ENVIRONMENTAL PROTECTION EXPENDITURE

Environmental protection investment includes all expenditures for acquiring long-term tangible assets for the protection of the environment. The general objective of environmental protection investments is to gather, manage, monitor and control, reduce the volume, prevent and eliminate pollutants or any other environmental damage emerging from business activities. Environmental non-investment expenditure includes payroll, rent payments, utilities, energy and materials as well as payments for services for which the main purpose is environmental protection. The general objective of the environmental non-investments expenditures is the prevention, reduction, adjustment or disposal of pollution and pollutants originating from business activities.

The total environmental protection expenditure consists of environmental protection investment and environmental non-investment expenditure. During the years from 2003 to 2010, the total environmental protection expenditure showed an increasing trend. The share of the total environmental protection expenditure to the gross domestic product in this period, ranged from 1.6 to 2.1%.

Figure 26: Environmental protection expenditure (bil. CZK, current prices) and its share of the gross domestic product (%)



Source: Czech Statistical Office

In 2010, environmental protection investment amounted to 22.6 billion CZK (a 4% decrease compared to 2009) and predominately related to wastewater management which accounted for 40%. Environmental non-investment expenditure amounted to 53.4 billion CZK in 2010, (a 9.6% increase compared to 2009). The vast majority of non-investment expenditure, 66%, was related to waste management.

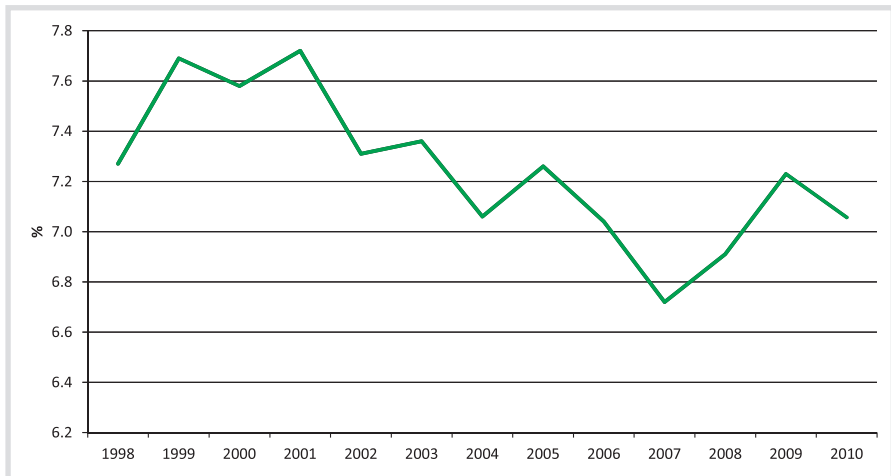
In 2009, the share of the total environmental protection expenditure to gross domestic product was 0.3 percentage points lower in comparison to the other EU27 countries. However, it should be mentioned, that the EU27 estimate is based inter alia on various time periods' data.

5.5. SHARE OF ENVIRONMENTAL TAXES

Environmental taxes as market-based instruments are levied on products and activities with a proven negative impact on the environment. Revenues from environmental taxes in the Czech Republic are compared with the total revenue from all taxes and social contributions.

Environmental taxes may be divided into three main categories: (1) energy taxes (taxes on energy products used for both transport, e.g. petrol, diesel and stationary purposes, e.g. fuel oil, natural gas, coal), (2) transport taxes (related to the ownership and use of motor vehicles) and (3) pollution/resource taxes. Pollution taxes include taxes for emissions into the air (except for carbon dioxide taxes) and water. In the Czech Republic, energy taxes represent the largest amount of environmental taxes, over 93% in 2009.

Figure 27: Environmental taxes as a share of total tax revenues (%)



Source: Czech Statistical Office

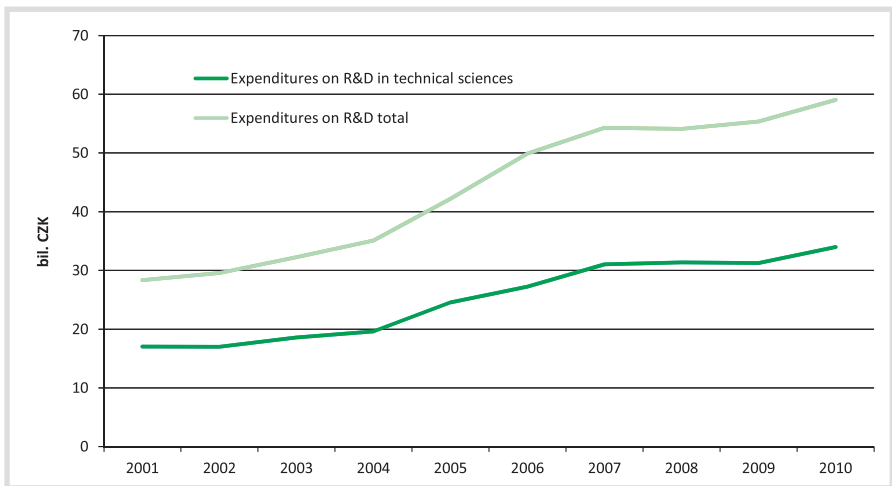
In 2010, revenues from environmental taxes accounted for 7.06% of the total revenue from all taxes and social contributions. In the period from 1998 to 2010, the highest share of environmental taxes was in 2001, reaching 7.72%, with revenues from environmental taxes being 1.8 billion EUR. In 2008, the highest revenues from environmental taxes reached over 3.6 billion EUR, accounting for 6.91% share. Between 1998 and 2010, the share of environmental taxes ranged from 6.72 to 7.72%, which nearly corresponds with the EU27 level, ranging from 6.04 to 6.98%.

5.6. EXPENDITURES ON TECHNOLOGICAL RESEARCH AND DEVELOPMENT

The expenditures on technological research and development indicator is designed as an amount of current and capital expenditures on R&D from business-enterprise, government, higher education, and the private non-profit sector. This indicator is expressed as total expenditures in research and development and total expenditures allocated to technical sciences (engineering) in current prices.

Expenditures on R&D can be cautiously interpreted as an increase in knowledge and preparedness for greener growth. Investment in technical sciences can be further interpreted as knowledge-intensification of the economy in applied research and as improvement of technology competences necessary for green growth.

Figure 28: Expenditures on R&D (bil. CZK)



Source: Czech Statistical Office

Expenditures on research and development in the Czech Republic are on the increase. Since 2002 expenditures on development in technical sciences have increased by a slower rate compared to the total amount for research and development expenditures. This trend changed in 2007, when technical sciences started to grow at more or less the same pace as total expenditures.

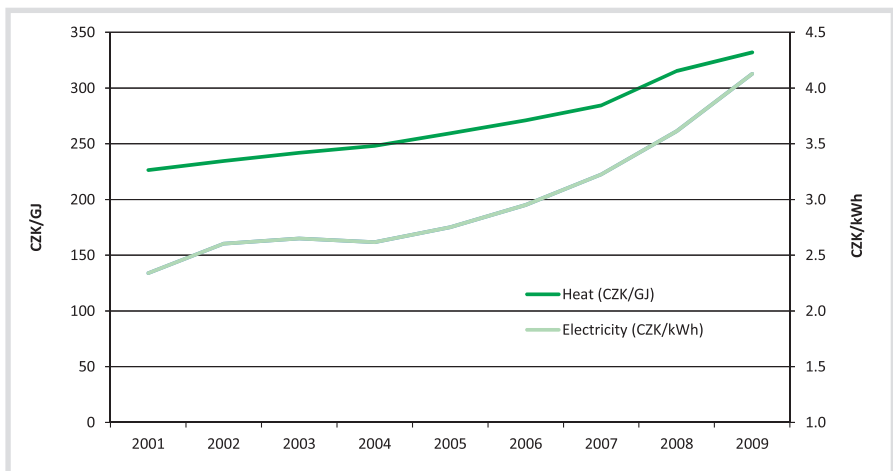
The share of expenditures on technical sciences research and development is 56% of total research and development expenditures. Total expenditures on research and development were about 1.5% of the gross domestic product. This is comparable with the EU27 average, which is about 1.8% of the gross domestic product.

5.7. ENERGY PRICES

Energy prices are expressed as the average electricity price for the medium size household and the weighted average price for heat generated from coal. Prices are presented in the current prices of the selected year.

Energy prices may have a positive influence on innovation and use of alternative fuels, however high energy prices may also slow down economic growth. High energy prices provide negative motivation for energy consumption encouraging energy savings as well as energy improvements. Energy prices in the Czech Republic are highly influenced by environmental taxation and by the support provided for renewable energy sources.

Figure 29: Energy prices (CZK/GJ, CZK/kWh)



Source: Energy Regulatory Office

The average energy price for households has almost doubled since 2001. This development is a result of many underlying factors. Among the main reasons for this growth are the increasing price of raw materials on the international markets and the opening up of the Czech energy market to international competition. The price of heat has also been increasing but at a slower pace than electricity. No international comparison for this indicator is possible owing to different methodologies and price levels.