

ECONOMIC TRANSFORMATION, ENVIRONMENT AND THE MANUFACTURING IN SLOVAKIA: FROM HIGH ENVIRONMENTAL IMPACTS AND HIGH EMPLOYEMENT TO TREADMILL OF PRODUCTION?

THE ENVIRONMENT AND THE LABOUR.

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Abstract:

The past two decades in Slovakia were the years of rapid development of the new environmental policies and institutional frameworks, mostly propelled by the European Union integration process. On the same time, it was the time of rapid economic transformation, opening to the global market, privatization and changes in the labour market. Environmental norms and standards are often perpetuated in public debate as the obstacle and threat to employment. On the other hand, industry is seen as one of the main factors in production of the negative environmental impacts. The question we explore is what is the environmental performance of the industry vis-à-vis employment in the industry? The key indicators we analyse are CO₂ emissions and number of jobs in the manufacturing industry. We claim that the industry-environment relationship went through 3 interlinked and overlapping phases. The first one (1990-1998) was marked by deindustrialization of whole regions, and collapse in many branches of the economy. It was the time of rapid development of environmental policies, but its limited enforcement. The second phase (1998-2008) is characteristic by gradual re-industrialisation caused by orientation of the industry on semi-products for the European market and by shift of production from Western Europe to the Eastern countries. Access to the European Union and especially Single European Market put stress on implementation of the environmental norms and standards. The third phase (2008 on) shows

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trends, which may be analysed using conceptual framework of the Treadmill Theory suggested by Alan Schnaiberg. Keeping the production costs low, while increasing amount of outputs leads to the most challenging and problematic discrepancy we find between the environmental impact and employment. It is automatization accompanied by gradual decrease of workforce and parallel increase in energy and material consumption. While deindustrialisation was characterised by abrupt fall of emissions accompanied by a sharp decline in employment, the second and especially the third phase is more complicated and is characteristic by increasing economic output on the account of increasing energy/material consumption and decreasing amount of jobs in the economy. In conclusion we discuss several macro-level policy option how to revert adverse economic and social trends. Here we focus on merging the environmental and social agenda and critical evaluation of green jobs concept. In the second flow of argument we discuss concept of re - localization, or approaches of how to return green economic activities back to the people in marginalised regions.

Key words: Treadmill of Production, Labour Market, Environment.

Abstrakt:

Posledné dve desaťročia boli na Slovensku rokmi rýchleho vývoja nových environmentálnych politík a inštitucionálnych rámcov, ktoré boli stimulované hlavne integračnými procesmi Európskej únie. Súčasne to boli roky rýchlej ekonomickej transformácie, otvárania sa celosvetovému trhu, privatizácie a zmien na trhu práce. Environmentálne normy a štandardy sú často vo verejnej diskusii pertraktované ako prekážky a hrozby pre zamestnanosť. Na druhej strane je priemysel vnímaný ako hlavný faktor negatívnych environmentálnych vplyvov. Otázka, ktorou sme sa zaoberali je, aké sú environmentálne dopady priemyslu v porovnaní so zamestnanosťou, ktorú vytvára. Kľúčové indikátory, ktoré sme analyzovali sú emisie oxidu uhličitého (CO_2) a počet pracovných miest vo výrobe. Tvrdíme, že vzťah priemyslu a životného prostredia prechádzal tromi prepojenými fázami. Prvá (1990-1998) bola v znamení deindustrializácie celých regiónov a kolapsom v mnohých odvetviach ekonomiky. Bolo to obdobie rýchleho vývoja environmentálnych politík, ale ich minimálneho uplatňovania. Druhá fáza, v rokoch 1990- 2008, je charakterizovaná postupnou reindustrializáciou spôsobenou orientáciou priemyslu na výrobu polotovarov pre európsky trh a presunom výroby zo západnej Európy do východných krajín. Prístup do Európskej únie

a hlavne do systému jednotného európskeho trhu Slovensko nútil prijať normy a štandardy v oblasti životného prostredia. Tretia fáza, od roku 2008, vykazuje trendy, ktoré môžeme analyzovať použitím teórie bežeckého pásu (Treadmill Theory) Alana Schnaiberga. Najväčšia nehoda, akú sme našli medzi vplyvmi životného prostredia a zamestnanosťou vzniká, keď sa udržiajú nízke výrobné náklady pri výrobe, je spojená so znižovaním počtu pracovníkov a súčasným zvyšovaním spotreby energie a materiálu. Zatiaľ čo deindustrializácia bola charakteristická výrazným znižovaním emisií spojených s prudkým znižovaním zamestnanosti, druhá a hlavne tretia fáza je oveľa zložitejšia a je charakterizovaná zvyšovaním výroby spojenej so zvyšovaním spotreby energie a materiálu a znižovaním počtu pracovných miest v ekonomike. V závere článok diskutuje niektoré možnostiach, ako zvrátiť nepriaznivé ekonomické a sociálne trendy na makro úrovni. V tejto časti sa sústreďuje na prepojenia sociálnych a environmentálnych činností a kritické hodnotenie konceptu zelených pracovných miest. Taktiež sa dotýka problému, ako opäť vrátiť zelené pracovné miesta do zaostávajúcich regiónov.

Kľúčové slová: teória bežeckého pásu, trh práce, životné prostredie

INTRODUCTION

Rapid changes can be seen in the landscape of Slovakia. Smoking chimneys, once a proud symbol of the industrialisation and progress for some, and a clear target of criticism by others, have been extinguished. Grass now covers many large industrial production workshops along the railways. At the outskirts of Western Slovakian towns we see shining blocks of car assembly lines, which have recently risen and are expected to remain for an unclear period of time.

As the centrally planned regimes in Central Europe came to an end, environmental activism was one of the strongest islands of resistance. Not surprisingly, air pollution, drastic devastation of the landscape through mining, and insensitive building of water dams raised public resistance long before other topics took over. From an environmental perspective the first years of the economic transformation seemed to be a golden age. The old threats were disappearing and the new ones were not yet on the horizon. Strengthening of the legislative framework (later propelled by the prospect of European Union accession) and adoption of

institutionalised environmental policies went in parallel with the rapid economic transformation. Yet, there were social impacts closely affiliated with these changes.

Many of the polluting workshops became bankrupt and many industrial plants were abandoned practically overnight. Privatisation, liberalisation and opening up to global competition meant rapid de-industrialisation of cities and whole regions. Unemployment in the former industrial cities such as Gelnica or Prakovce rose above 30%. Those surviving the changes mostly produce parts for multinational companies, providing job opportunities for only a fraction of the workforce. Just to illustrate the types and speed of the changes, a mine and metal processing company in Rudňany had more than 2,500 employees in 1990. Within just a few years this was reduced to practically zero. The rapid transformation went in parallel with rapid development of mechanisation and information technologies.

After more than two decades of the economic transformation we find better environmental quality in Slovakia, but at the same time more unemployment. Environmental sustainability with its goal of balancing economic, social and environmental goals and once presented as the corner stone of the new society is surviving at the edge of interest. Based on the statistical data and surveys outcomes we explore how does the economic transformation affects quality of the environment and resources consumption vis-a-vis labour market.

The first years of the economic and social transformation were in Slovakia accompanied with rapid development of the new environmental policy, legislation and institutional framework. Mostly propelled by the European Union accession process.

At the same time, the economic transformation meant dramatic shift in the production and consumption patterns. Manufacturing and heavy industry (once flagship of the former regime) has rapidly downsized. Smoking chimneys and big enterprises - visual symbols of the environmental devastation in the former central planning do not exist anymore. On the other hand are these very regions nowadays symbols of high unemployment, backwardness, and social tension.

For the purpose of the article and research we tentatively distinguish two phases of the economic transformation, although there is no clear dividing line and the two phases has been for most of the time running in parallel. We therefore do not set forth any year as the milestone,

also the year 2004 with the accession of Slovakia to the EU may be seen as approximate time, when the second phase definitely prevails. In the same, there are indications that the actual deindustrialisation started already in the previous regime, but was blocked by the social aspects of keeping the employment as the primary justification of the socialist regime.

In the first part of the article we evaluate economic trends in the first phase of the transformation from its impact on the environmental pollution and employment. Outcome of the rapid transformation and opening to the global competition has been deindustrialization of whole regions, and collapse in many branches of the economy.

The second phase of the transformation is characteristic by gradual re-industrialisation caused by orientation of the industry on semi-products for the European market and by shift of production from Western Europe to the Eastern countries. This re-industrialisation stage we analyse using conceptual framework of the Treadmill Theory suggested by Alan Schnaiberg. Keeping the production costs low, while increasing amount of outputs leads to the most challenging and problematic discrepancy we find between the environmental impact and employment. It is automatization accompanied by gradual decrease of workforce and parallel increase in energy and material consumption. While deindustrialisation was accompanied by sharp decline in employment on the background of improving majority of the environmental indicators, the second phase of re-industrialisation is more complicated and is characteristic by increasing economic output on the account of increasing energy/material consumption and decreasing amount of jobs in the economy.

These and other trends directly and indirectly influence regional development, social and economic disparities, employment and, more generally, distribution of environmental and social gains and losses. Applying the theoretical framework of Alan Schnaiberg and the “treadmill” of production, the article describes trends in employment *vis-à-vis* consumption of natural resources.

In the concluding part of the article we discuss the main areas where the environmental and social trends interact, overlap, influence each other, and create problems, but also provide very important challenges and opportunities. The focus here is links between the environmental agenda and labour market (i.e., green jobs). We briefly outline policies and

tools, which could (or perhaps should) create an enabling environment for the development and implementation of progressive measures.

DEINDUSTRIALISATION, RE-LOCATION AND THE ENVIRONMENTAL PARADOX

Analysing environment-related data and indicators of the Slovak and the European Environmental Agencies, we see a very similar pattern of development over the past 2 decades. Slovakia has been, with the exemption of transport pollution, steadily improving its environmental performance (Enviportal 2014, EEA 2007, 2010). This trend is also visible in the manufacturing sector, which is subject of the analysis and discussion in this article. The positive trends are influenced by three main factors. Firstly, collapse of the most problematic industrial production branches. Secondly, it is factor of outsourcing. There is a rapidly growing gap between those who benefit from the present production and consumption patterns and those who face the consequences. In other words, it is a question of who bears the adverse environmental impacts and who is exposed to pollution and challenges of the deteriorating ecosystems. Thirdly, there is technological progress, better technologies and pollution prevention measures impacting pollution from the manufacturing. As we further analyse in this article, all three factors contribute to decreasing amount of the environmental impacts from the manufacturing, while at the same time, they all impact labour market.

Deindustrialisation and outsourcing has been dominant factors in the first phase of the economic transformation. Typical example is textile industry. Textile industry has long tradition especially in the Czech Republic from where it went as a part of post WWII industrialization to Slovakia. The North part of the Czech Republic around Liberec were space of a thriving textile industry (even called the Manchester of Bohemia). Cities around Vah River in Slovakia like Piestany or Puchov produced in the 1970s and 1980s quantity of various textile products for home market and for the export.

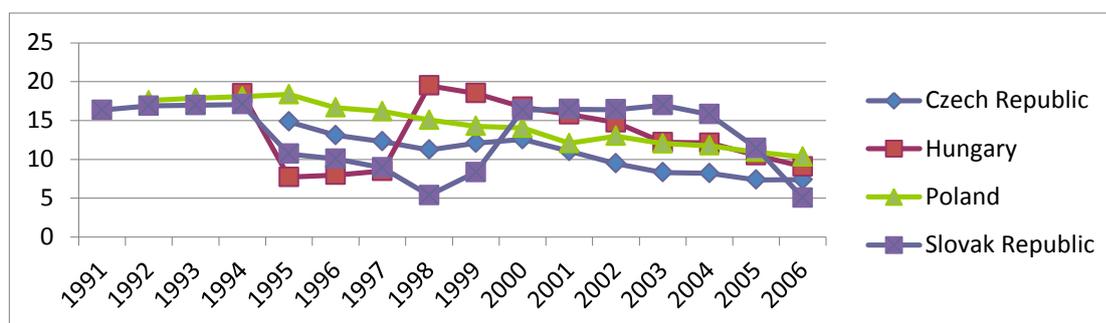
Economic changes in the early 1991 started free fall of the industry. First, the CONECO dissolution in 1991 meant end of the protected internal market of the former Eastern block.

Especially lost of the Soviet Union market was very painful. Central European companies were not able to compete with new emerging and cheap producers from East Asia or Turkey.

At the domestic market they have got under increasing competition from the western countries, who were flooding them with their goods (often produced in the Asian countries under their trade marks), using aggressive marketing campaigns and techniques. Privatized textile firms in the first years survived on the relatively cheap labour costs. As described by Van Voss (Van Voss et al 2010), in the first years of the transformation, many western companies moved to Czechoslovakia, which acquiescence in the role of dislocated production sites with clear sign of their economic dependency. Outward processing was their only way to enter Western markets. This strategy however did not last for long. For many companies the Czechoslovakia and its succeeding countries were one of the many transitional *pieds-a-terre* on their continuous search for the cheaper arrangement (Van Voss et al 2010: 71). As soon as the labour, material, energy and environmental costs of production started to increase, they moved to other eastern European countries (e.g., Romania) and later to Turkey and East Asia.

The heaviest environmental impacts in the textile industry are linked to textile production. Trends are illustrated by the figures on water pollution from the sector (Figure 1). Although there is strong impact of new environmental legislation implemented after the political changes and in line with the EU accession process, the pollution trends copy general development of the industry and its transformation.

Figure 1. Water pollution, textile industry (% of total BOD emissions).



Source: Adopted from the World Bank Data, 2013.

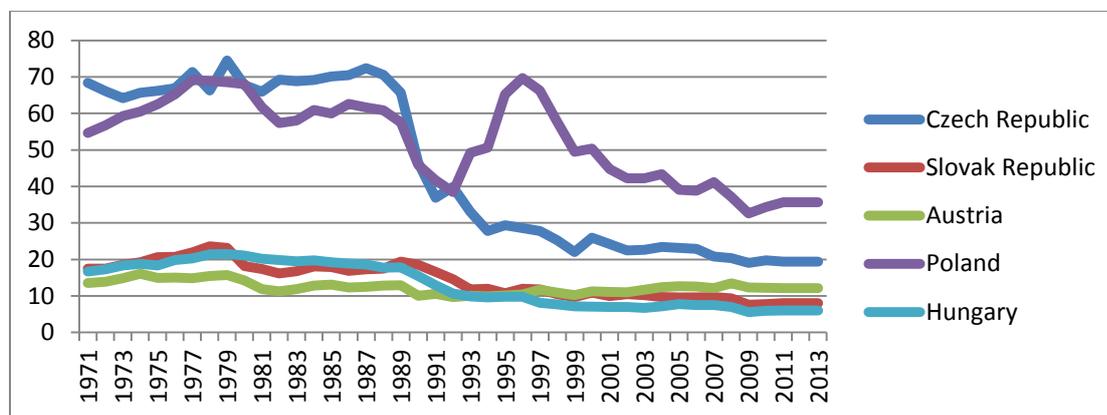
First decline we see in the transformation period (mid 1990s) and it can be affiliated with end of privatization, opening of the market and collapse of the export to Soviet Union. Signs of increase in late 1990s may be related to reallocation of part of the productive capacities from

the west to the region. After 2000 we see gradual decline of the industry affiliated with transfer to East Asia, Turkey and other countries.

In 1989 there were 47 801 employees in the fabrics production, in 2004 it was only to 15 651 employees (VÚEPP 2005). Decline in the fabrics' production was followed by gradual decline in the textile industry. While in 2000 textile industry provided 14,8 percent (57 404 employees) of all jobs in the industry, till 2006 it went down to 8,4 percent (45 124 employees). (Štatistický úrad SR, SLOVSTAT)

While textile industry is an example of gradual decline, the first phase of the economic transformation was also characteristic by rapid closure of mining industry, ore and metal processing. Sometimes whole branch of production disappeared with impact on the whole chain of production. This is case of weaponry, decreasing demand for mining and metal processing. Example is Central Spiš region, with Slovak "Rust Belt" in Prakovce Valley.³ If we take as an indicator of environmental impacts CO₂ emissions, the former Czechoslovakia was the biggest regional polluter (Figure 2).

Figure 2. CO₂ emissions from manufacturing industries and construction in Visegrad countries and Austria (million metric tons) (1970 – 2013).



Source: World Bank Data Indicators, 2014

As the data at figure 2 indicate, CO₂ pollution in Czechoslovakia started to decline already in early 1980s. Partly as the decline of production started already during the last years of the centrally planed socialism, partly because of investment into new technologies. These were to

³ Rust Belt is the informal description for a postindustrial region straddling the Northeastern and the East North Central States, referring to economic decline, population loss and urban decay due to the shrinking of its once powerful industrial sector. The term gained popularity in the United States in the 1980s (Meyer 1989, Teaford 1993, Crandall 1993).

great extent outcome of growing public pressure, where environmental issues become politicised by the regime opposition.

Environmental concerns were relatively high on the agenda in the first years of economic transformation and closure of the most problematic enterprises did not generate any significant opposition. The polluting and problematic nickel producing factory in Sereď, Slovakia was closed among the first. These days nickel is imported from Russia and New Caledonia, transferring the impacts from production elsewhere in the world.

The environmental paradox is, that despite the irreversible global consumption of natural resources and rapid degradation of ecosystems, local environmental situation in Slovakia has generally improved after the collapse of centrally planned economy. Yet if we zoom the picture we see, that decreased pollution is to a great extent outcome of outsourcing of the impacts (e.g., import of CO₂ emissions in products) and growing social disparities, where increasing part of the population is excluded from the job market and consumption. What is good from the environmental perspective is not always positive from the social one.

TREADMILL OF PRODUCTION

Deindustrialisation and outsourcing has been in parallel followed by another trends. Low labour cost and investment stimuli attracted another kind of outsourcing. There can be seen the movement of the manufacturing capacities from the west countries to Slovakia. Yet contrary to the original concerns, the outsourcing does not mean transfer of obsolete technologies (although this is also the case especially in SMEs), but often the most advanced technological solutions seen for instance in the automobile industry.

Keeping the production costs low, while increasing the level of outputs leads to the most challenging and problematic discrepancy we find between environmental impact and employment. A process visible in every developed economy is automation, being a gradual decrease of workforce with a parallel increase in energy and material consumption. American sociologist Alan Schnaiberg (1980) named this process as the “Treadmill of production”. The logic of the market in industrialised countries leads to an increase of manufacturing automation at the expense of employment, while simultaneously increasing the consumption

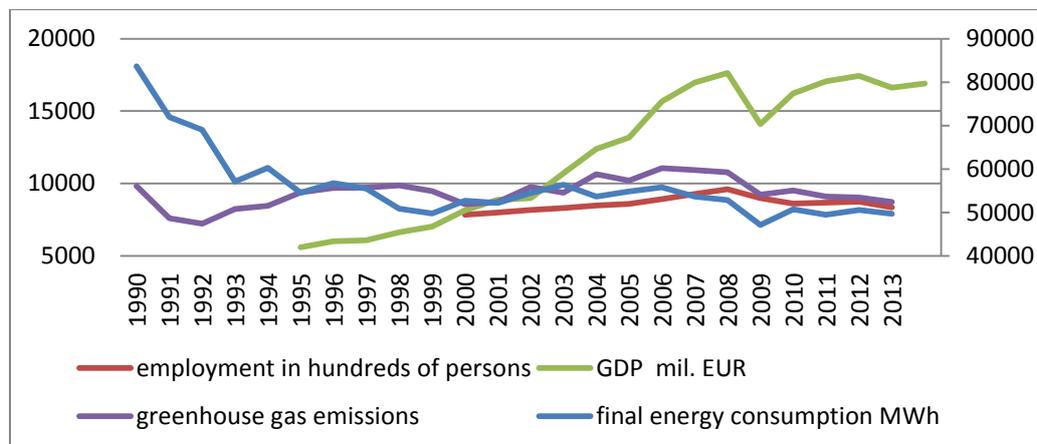
of materials and energy. This results in the gradual increase in energy prices and raw materials while reducing jobs. This happens initially for those with lower qualifications, and then gradually for other people higher in the social structures. The original analysis of these trends focused on the manufacturing sector, but it was later enlarged to encompass the services and administration sector (including the state administration). Here we see a similar transition to the more energy and technologically demanding systems employing less people.

The expansion of science and technology leads to the replacement of a large part of human labour by machinery and information technology (IT). At the same time it creates pressure to increase production, or (as in the case of services) decrease the cost of operations. The reason is that the introduction of machinery and information technologies, and the cost of the machines and IT itself, is cost-effective only if there is a substantial increase in production and/or decrease of the operating costs (Schnaiberg 1980, Gould *et al.* 2004). The ever-increasing production and consumption is accompanied by a loss of natural resources and an increasing amount of waste. In other words, technology and tools need much more energy and chemicals, and far fewer people compared to previous manufacturing and service processes based on intensive human labour.

Are the conclusions of Schnaiberg and his followers applicable in our context, and could we employ *Treadmill Theory* as a conceptual framework for analysing the situation in Slovakia? Due to the economic structure inherited from the past and the transfer of some production from other countries, Slovakia is currently one of the most industrialised countries of the European Union (EU). The proportion of GDP provided by industry reached 25.8% in the first half of 2013 (Slovak statistical Bureau 2013) and the proportion is only higher in Romania and the Czech Republic.

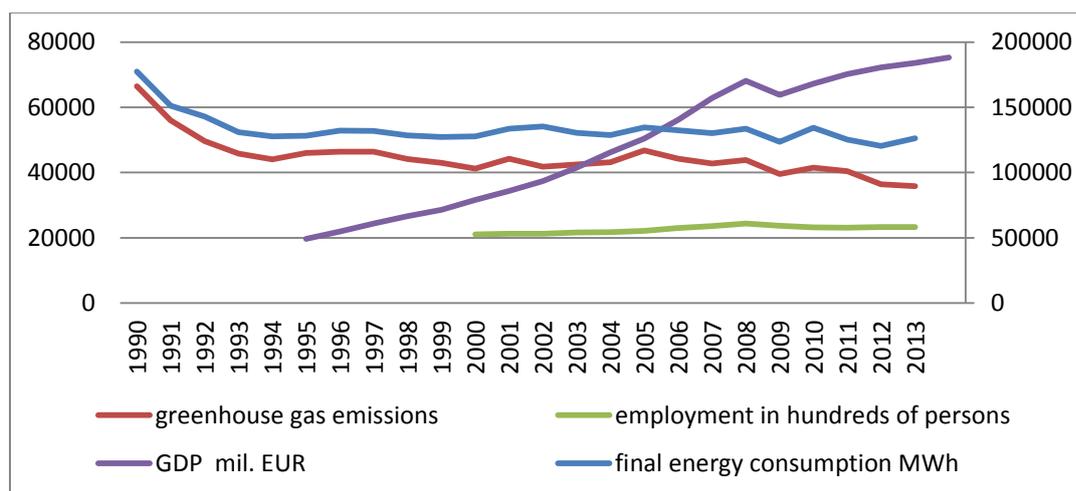
Looking at the industrial production data in Slovakia, we see that the country has been through similar stages to many other states and regions. The second phase of transformation can be positioned in the 2000s. If we take the year 2000 as our point of departure, there are certain trends, which support Schnaiberg's observations with the exemption in years of crisis.

Figure 3. Trends in industry.



Source: Eurostat, Slovak Hydrometeorological Institute⁴

Figure 4. Trends in Slovakia.



Source:

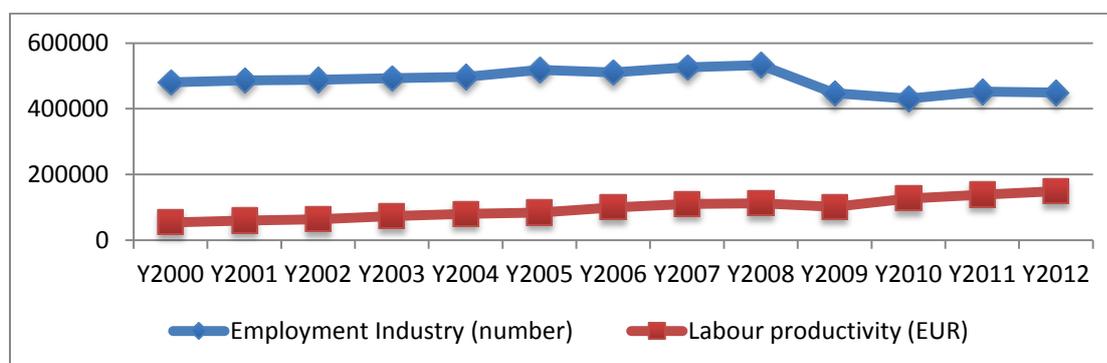
Eurostat, Slovak Hydrometeorological Institute

In Slovakia, production grew between 2000 and 2012. This trend was interrupted by the economic crisis and there was a temporary decline in production of 14.1% between 2008 and 2009. The economic crisis caused production to slow down, but despite this, the industrial production index⁵ rose from 103.6 in 2001, to 110.3 in 2012 with an increase of 10.3 % in 2012 alone. When we further analyse labour productivity *vis-à-vis* employment, trends support Schnaiberg’s initial claims. We see an increasing productivity accompanied by a decreasing number of people employed (See Figure 1).

⁴ Slovak Hydrometeorological Institute. All the data from source Slovak Hydrometeorological institute are anticipatory, unofficial, uncertified, fixed to August 28, 2015

⁵ The level in 2000 is 100.

Figure 5. Slovak industry and trends in the years 2000–2012: development of labour productivity in industry (EUR) and the development of the registered number of employees in industry (people).



Source: Adopted from Slovak Statistical Bureau and Slovak Environmental Agency data, 2013.

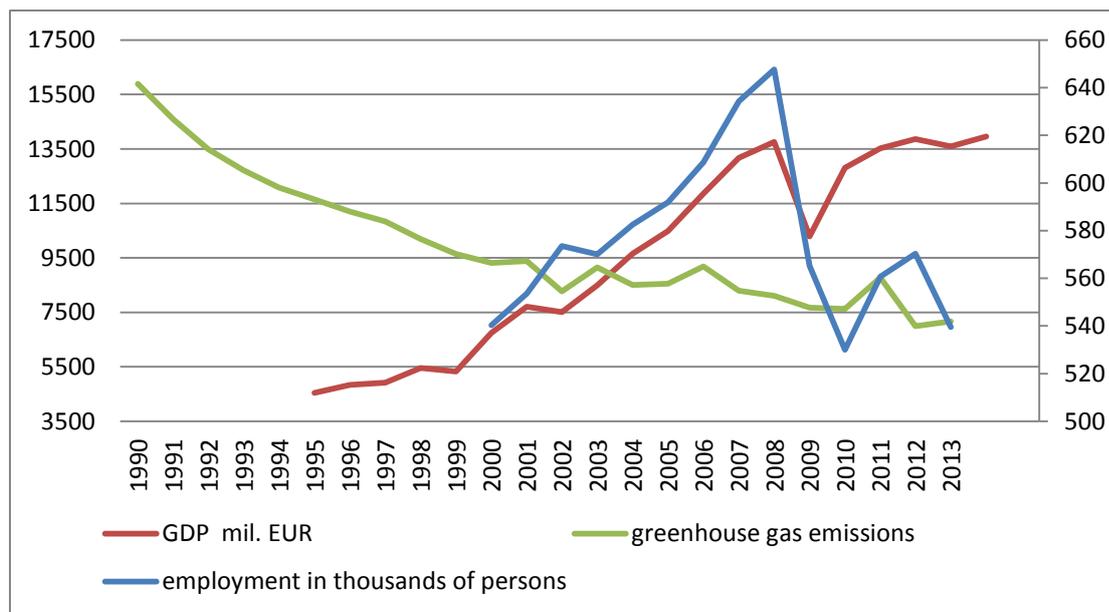
Year	2008	2009	2010	2011	2012	2013
Employees (Industry)	591665	530921	511758	529657	524833	516996

Source: Slovak Statistical Bureau, 2014

According to Schnaiberg’s theory, a decrease in employment should be accompanied by an increase in production and by an increase in energy, material consumption and waste. In 2001, industry accounted for 35.8% of the final energy consumption of fuel, electricity and heat. By 2011 the industrial share in the overall consumption had decreased to 34.7%. In 2011, the ironmongery and steel sector accounted for 30.9% of the final energy consumption of fuel, electricity and heat in industry and cellulose, stationery and printing accounted for 15.5%. In 2011 compared with 2001, the final energy consumption of fuel, electricity and heat in the industry decreased by 14.7% (over the entire national economy, the decrease of final energy consumption of fuel, electricity and heat was 12.1%). In this sense, we see here an actual decoupling of energy consumption from economic growth (Figure 2).

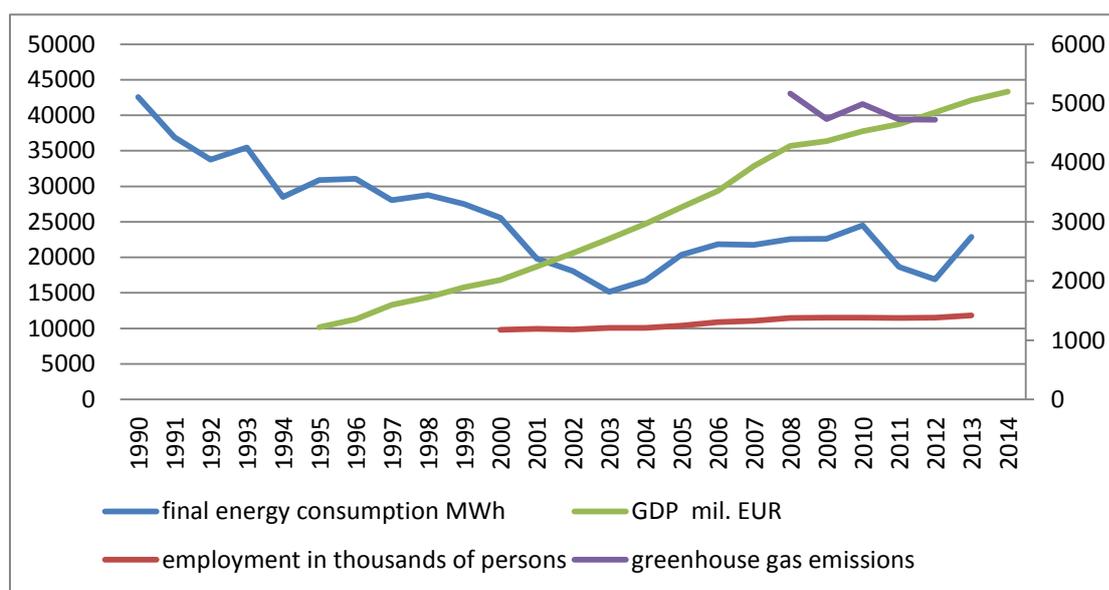
Very similar situation we can see in other sectors of economy. All of them confirm the Schnaiberg's theory. We can see decrease in employment, energy consumption and employment accompanied with increase in GDP.

Figure 6. Trends in manufacturing.



Source: Eurostat, Slovak Hydrometeorological Institute

Figure 7. Trends in services.



Source: Eurostat, Slovak Hydrometeorological Institute

From this perspective, increase in production is for this time period (as we discussed in the previous paragraphs) accompanied by a decrease in employment, but there is no correlation with increasing energy consumption. This can possibly be explained by the starting position of the Slovak industry and its energy efficiency. The target in Slovakia is to save 12,405 Tera-Joules of energy by 2016, and as much as 30% of this should be from savings in Slovak industry. According to *The Slovak Republic Action Plan for Energy Efficiency 2011-2013*, the overall energy consumption in Slovakia decreased between 2002 and 2008 by an astonishing 32% which was the biggest percentage change among all OECD countries. Even if we take into account the economic crisis, it is clear that the country had and still has an enormous potential for savings in energy. Slovak industry is still among the very energy demanding industries within the EU.

Increasing productivity (together with global production and consumption patterns) leads to a decreasing demand for labour. It is not a new trend and so far it has been counterbalanced by an increase of employment in services. Yet services are also going through a similar transition and are hardly able to absorb the unemployed workforce. In this context, the environmental question is increasingly not only a problem of protection of scarce resources, but also a problem of finding a balance between labour, resources and sustainability.

THE TRENDS AND ALTERNATIVES

In the previous sections we analyse some of the environmental trends vis-à-vis their environmental impacts. Deindustrialisation, outsourcing and treadmill of production were identified as the main driving forces shaping performance of the Slovak industry, its environmental impacts and provided labour opportunities. Small and open economy inevitable depends on broader context and development is shaped by global and multi-national frameworks (i.e., the EU and global free trade agreements). The main policy vision of the European Union, supported in the cohesion countries by the EU funds is the Europe 2020 document, with its three main goals of smart, inclusive and sustainable growth.

The present treadmill of production logic is more and more applied on the sector outside of manufacturing and we seen rapid changes in the services, public administration, education or health care. Its common denominator is increasing productivity based on automatization and

decreasing demand for labour. At the same time austerity measures decrease purchasing power of the public. Outsourcing of production capacities further east may start second wave of deindustrialisation in the upcoming years.

Alternatives to counterbalance negative trends mostly operating with concepts of green growth, redefining economic goals (e.g., de-growth or steady-state economy), re-location of economic activities (e.g., economic cohesion policies) and enlargement of market opportunities for new types of employment (e.g., green jobs).

Industrial production and the accompanying consumerism have been traditionally seen as the main cause and propeller of growing adverse environmental impacts. Environmental modernisation concepts (such as green growth, low-carbon economy, and sustainable development) have long tried to reconcile tensions between development and its environmental and social costs. The future economy is seen as being one of zero waste, closed loop production, and low energy intensity. We will put aside the question of how this is actually possible in the longer run and on a global scale and instead focus on the relationship between the economy, environment and jobs.

Approaches are based on the focus of environmental modernisation on a gradual shift from traditional energy intensive and waste producing industrial models, towards an economy based on renewable energy, resource efficiency and zero waste strategies. Consumption is seen in this perspective as a problem that can be addressed by green design, reuse, recycling and sharing.

One of the arguments in favour of the changes is that they may simultaneously decrease environmental impacts whilst providing new labour opportunities to replace those disappearing in the traditional branches of industry. These jobs are then labelled as green. In other words, promotion of these new approaches is not viewed as job damaging and eliminating, but rather as an option for creating new and lasting job opportunities for both high and low skilled employees. The basic problems with green jobs relate to their definition, quantifying/estimating the number, stimulating their creation and determining how to make them last.

The UN Environment Agency defines green jobs as jobs in agriculture, manufacturing, research and development, administration, and services that contribute substantially to preserving or restoring environmental quality (UNEP 2009: 3). Specifically (but not exclusively) we talk here about jobs in the protection of ecosystems and biodiversity, production of renewable energy, energy efficiency, dematerialisation of consumption, water consumption through high efficiency strategies, reducing economic dependence on carbon fuels and minimising their generation, and a gradual phasing out of all forms of waste and pollution.

The EU commissioned a study from 2007 (GHK 2007) which estimates that around 6% of jobs in the EU-27 can be classified as green jobs and the sector is rapidly growing. The EC target of achieving 20% of energy production from renewable sources by 2020 should alone create 2.8 million new jobs (EC 2010). German renewable energy industry in 2010 employed approximately 370,000 people and replaced the import of energy valued at 5 billion euros. The benefit from the manufacture of biomass boilers in the Czech Republic is to be more than 2,700 jobs (as a conservative estimate). This is likely to grow depending on the number of installed boilers and supply of "market" fuel (Zámečník and Hlaváč 2010: 7). Vladimír Špidla (2013) estimates, that if the Czech Republic reaches the German stage of sector development, there would be a potential for 100,000 new jobs in the renewable energy sector.

The German example is an important one for the CEE countries. If we compare the figure of 370,000 people in Germany employed in the renewable energy sector to the size of the population, it equals roughly 1 job per 217 inhabitants in Germany, compared to 1 job per 1800 inhabitants in Slovakia. While Germany set targets for renewable energy well above the EU requirements of 20%,⁶ Slovakia reaches only the minimal level required. From this perspective, it seems that the number of jobs in the renewable energy sector is growing fast in Germany and the gap will increase even if Slovakia actually reaches its target of 14 % of total energy consumption from renewable sources by 2020.

⁶ Germany plans 35% of renewable electricity and 18% of renewable energy by 2020.

So far, the most comprehensive and detailed analyses of the green jobs situation and potential in Slovakia, has been carried out by Pavol Bellan (2010). According to his work, any calculation concerning the range of green jobs in Slovakia is complicated. One method is to base estimates on international studies of eco-industry using the classification of Environment Goods and Services Sector (EGSS). Building on this approach, Bellan estimated direct employment in the EGSS in Slovakia between years 1999 and 2000 as 24,000 to 25,000 FTEs⁷. However studies differ in determining the structure of employment as well as the volume of indirect employment (4,000 to 14,000 FTE). As he points out, conclusions from later studies conducted in the years 2006 and 2009 on employment in EGSS are not consistently comparable with these numbers. His estimates for Slovakia (according to the most optimistic scenario) are that the number of direct and indirect jobs in the renewable energy sector up to 2020 could reach almost 10,000 work places. This is far beyond expectations for this sector suggested by the German example, although we must take into account that Slovakia has had limited investment in development and manufacturing of renewable energy technologies so far and most of the jobs are in construction, operation and maintenance.

The agricultural sector is an important generator of green jobs especially in rural areas and for low skilled labour. Here we see several adverse trends and barriers to the development of the biomass energy production schemes, organic and alternative agriculture sector as a source of green jobs.

Former cooperative farms mostly collapsed years ago and ownership of the land is fragmented due to historical reasons; there has been equal division between heirs under Hungarian law compared, for instance, to the Czech Republic, where the Austrian law of the oldest son becoming the landowner applied during the Austro-Hungarian Empire.

The recent trend, following the treadmill production logic, is a gradual concentration of ownership by bigger industrial enterprises built on extensive agricultural practice, mechanisation and IT. Land grabbing, a phenomenon recognised more in the developing

⁷ Full Time equivalent (FTE)

countries, is becoming widespread in the CEE, endangering longer-term prospects of sustainable agricultural practices.

Renewable energy production, energy efficiency and agriculture are the sectors with the biggest potential for the generation of green jobs. Information about other services and sectors is scattered and trends predominantly depend on the speed of environmental modernisation (e.g., new technologies and better waste management practice).

The lesson learned from many countries which are serious in supporting green jobs suggests that prudent and informed policy decisions, based on internalisation of the external costs, and careful planning of supporting policies and economic incentives are required to stimulate this segment of the economy. To illustrate this point, let's have a look at a few examples. The United States in 2007 passed a new law on green jobs (The Green Jobs Act of 2007)⁸. This tool provides 125 million USD annually to train workers and create jobs in the clean energy sector. At least 15 million USD of this amount must be used to create jobs for adults living below the poverty line. It is expected that the bill will help to create around 35,000 new jobs annually. Another example is *Going for green growth: A green jobs strategy for Scotland*. This is a policy to promote job creation in the management of natural resources, renewable energy, waste management and industry.

According to Angelov and Johansson (2011), the newly created jobs are strongly polarised; they are either in hi - tech industries, or are opportunities for low-skilled labour. Green jobs could, in our context of Central Europe, provide a much needed opportunity for structurally unemployable people and for those in marginalised regions. In other words, they would provide employment opportunities for people with lower education, who need it the most, such as those in rural areas with high levels of poverty, high unemployment and low labour mobility. Susan George (2010) talks in this sense about *re - localisation*, or simply a return of economic activities back to local people. The problem is that our economic model builds on centralised production and automation. Solving this contradiction would require certain stimulation and protection of green jobs, which might be achieved for example, through a tax system favouring smaller enterprises in marginalised regions.

⁸ See Green Jobs Act website: <http://www.greenjobsact.com/>.

The conceptual question is how the green jobs are defined in the context of economic development. In today's prevailing terms and simplified understanding they are seen as a sort of appendage to the labour market. Yet instead of talking narrowly about the green jobs we should analyse the possibility of a green economy built on social grounds. The question of labour is crucial to any discussion about a sustainable system. Work is not just a contract between the employee and the employer, nor solely a simple activity required to obtain a livelihood. For most people it is a way of self-realisation, a way to obtain respect and confidence. The challenge is how to direct this creative human power into activities that meet human needs while being environmentally sustainable.

The main concern is however, how many of these jobs is an economy really able to generate and affiliated problem of outsourcing of the jobs, which follows the very same logic as all other economic sectors.

Jobs creation has been historically and traditionally understood as an outcome of economic growth. The growth based on the exploitation of fossil fuels, industrial production, intensive agriculture and consumerism, encouraging the purchase of goods and services in ever-greater amounts. This model has proved to enhance social progress for many (although we may discuss its distribution both within the nation states, and globally), yet at the same time it has been reaching its ecological limits as know with increasing certainty that we face irreversible losses of biodiversity and climate change that pose key challenges to future development. The question is posed as to whether such growth, based on expansion and unsustainable exploitation of natural resources, can still provide enough work, income and opportunities for the population.

CONCLUSIONS

As we analysed and discussed in this article, recent economic trends in Slovakia (following the wider global patterns) were based on deindustrialisation, outsourcing and simultaneously on increase of manufacturing automation at the expense of employment, while increasing the consumption of materials and energy. While the original analysis of treadmill production trends focused on the manufacturing sector, it is now enlarged to encompass the services and administration sector (including the state administration). Here we see a similar transition to the more energy and technologically demanding systems employing less people.

These trends lead to crisis of legitimisation – administrative system cannot compensate growing expectations and as we discussed, the alternative green jobs and green growth economy inevitably follows the same logic of treadmill, while providing very limited opportunities to compensate for the job loses in the other economic sectors.

There is discrepancy between internal and external costs of production. The lower the external costs of production reflected in the price of the product (such as labour, transport infrastructure, environmental impacts and social impacts), the greater the manufacturer's profits: a trend sometimes labelled as *privatisation of profits* and *socialisation of costs*. Production needs to be cheap and increasing in quantity. Yet the more that is produced in this way, the bigger the environmental impacts. This leads us to the question of alternatives the present system of production and consumption and their viability within the current political framework.

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