



## ANALYSIS OF THE LEGAL FRAMEWORK IN THE SUSTAINABILITY AREA ACROSS V4 COUNTRIES

### Czech report

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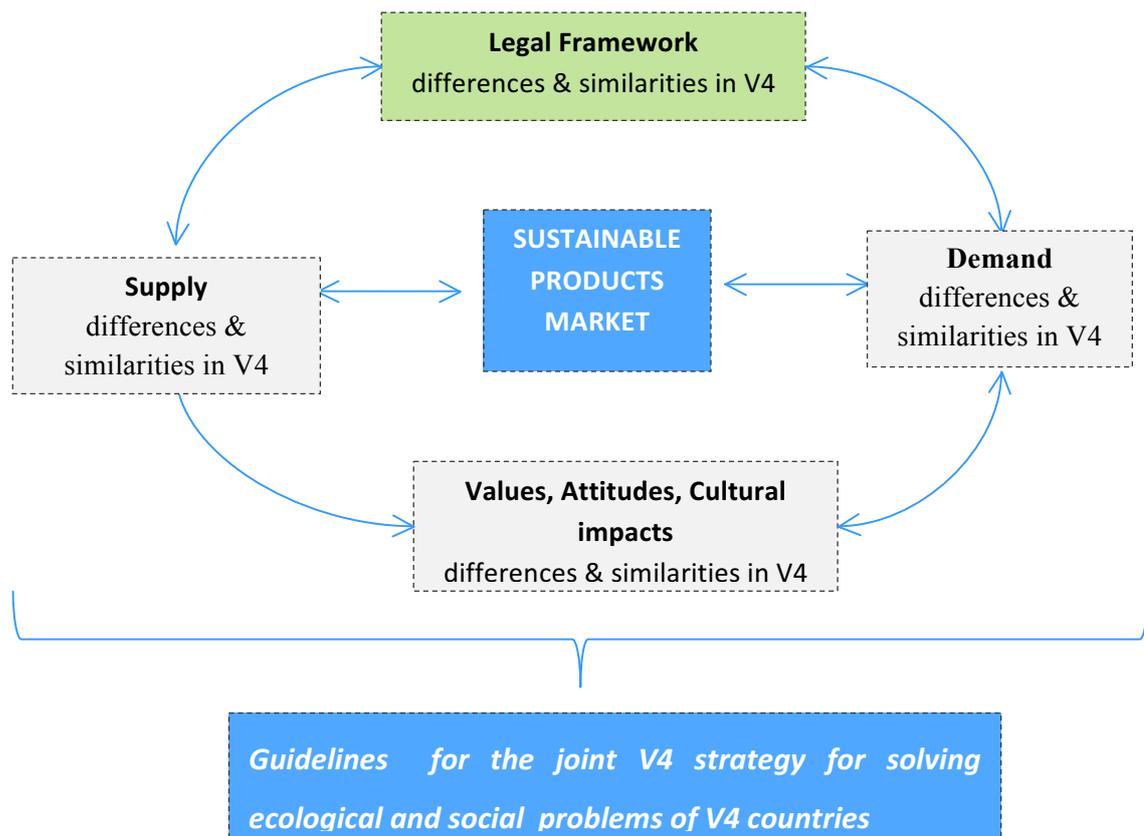
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[project website : www.k48.p.lodz.pl/ecomarket](http://www.k48.p.lodz.pl/ecomarket)

## The Approach and Objectives

The objective of this project is to support and strengthen the cohesion of the V4 countries in their efforts to achieve a more sustainable consumption culture and thus more sustainable production models in the selected consumer goods' markets. In the project this is done within the analysis of intermediate connections and influences of:

- Demand side of the market – consumers
- Values, attitudes and cultural impact
- Supply side of the market – produces
- **Legal framework**



This report will concentrate on analysis of the legal framework in the sustainability area across v4 countries.

The report was prepared in the framework of the project "Prospects of the Visegrad cooperation in promoting a sustainable consumption and production model" The project is supported by the International Visegrad Fund <http://visegradfund.org/>

## Policies in the area of sustainable development in the Czech Republic

### Introduction - Legal Frame in Brief

(General view)

### Sustainable Development Strategy in the Czech Republic

(Legal frame point of view – eco-labelling included)

### Sustainability of textiles in brief and with a positive

Consumer awareness

Textile research and sustainability

Eco-innovations

### Summary

## CHAPTER 1

### Introduction on Sustainability and its Legal Frame in Brief (General View)

Sustainability issues are being analyzed and “solved” not only within the area of our V4 countries, but of course, it is a leading topic dealt in the European Union and in other non-member states all over the Europe and the world (the topic itself has been already settled e.g. in the United Nation Agenda).

The V4 countries legal, political, economic, social and cultural plans and strategies on sustainability are in fact – in most - derived from the findings and strategies declared and accorded by the two a.m. authorities, to be more accurate from:

- Agenda 21 (a non-binding, voluntarily implemented action plan of the United Nations with regard to sustainable development) and
- EU<sup>1</sup> regulations, decisions, directives and other issues on sustainability (e.g. 7th Environment Action Program (EAP), which will be guiding European environmental policy until 2020).

As regards the “legal framework” itself – it is just reflecting the above listed. The legal data source can be found on EUR – Lex, where all the information on EU legal issues – e.g. the a.m. 7<sup>th</sup> EAP, are available.

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<sup>1</sup>Over the past decades the European Union has put in place a broad range of environmental legislation.

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The Legal Frame is toughly described in the E U R O P E 2 0 2 0<sup>2</sup> (A European strategy for smart, sustainable and inclusive growth) and is described as follows:

*“The European Council will have full ownership and be the focal point of the new strategy. The Commission will monitor progress towards the targets, facilitate policy exchange and make the necessary proposals to steer action and advance the EU flagship initiatives. The European Parliament will be a driving force to mobilize citizens and act as co-legislator on key initiatives. This partnership approach should extend to EU committees, to national parliaments and national, local and regional authorities, to social partners and to stakeholders and civil society so that everyone is involved in delivering on the vision.”*

The Czech Republic comprehends and follows the UN/OECD/EU recommendations, regulations and/or legislation on sustainability and other related issues. As stated above, the European Commission<sup>3</sup> itself is monitoring the implementation of EU legislation in the EU Member States to ensure that the laws achieve their intended objectives and the all countries of the EU respect the rules that have been agreed. The most common way of doing this is through monitoring and reporting<sup>4</sup>.

To sum up, the Czech Republic (not only) “Legal” issues related to Sustainability are derived from the UN, OECD and EU agenda, where the crucial “task” is – in fact - to establish a consensual framework for the preparation of materials/dB/systems and other – not only legal phenomena - to support sectoral policies and strategies related to sustainability and environment policies . Further on, in the text, some of these are mentioned.

## CHAPTER 2

### Sustainable Development Strategy of the Czech Republic

The historically first Sustainable Development Strategy of the Czech Republic was approved by Government Resolution no. 1242 of 8 December 2004 as a long-term framework for political decision-making in the context of the international commitments made by the Czech Republic in connection with its membership in the EU, OECD and UN, while respecting the specific conditions of the Czech Republic.

<sup>2</sup>Europe 2020 Strategy was adopted in 2010 and contributed to lay the foundations for a more sustainable future built on smart, sustainable and inclusive growth.

<sup>3</sup>On the European Commission pages, there are Environmental Topics, where up-to-date data can be found.

<sup>4</sup>The European Commission (DG Environment) is often working together in close collaboration with Eurostat, the Joint Research Centre and the EEA or other agencies (e.g. EFSA) depending on the legislation concerned.

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In consequence to the SDS, Progress Reports are made under the auspices of the Government Council<sup>5</sup> for Sustainable Development with the objective to map the fulfillment of the SDS goals and inform both politicians and the public about the state and development of the Czech Republic in respect of sustainable development. According to the present Statute, the Prime Minister holds the office of the Chairman of the Council. Minister of the Environment acts as an Executive Vice-Chairman, the two Vice-Chairmen of the Council are Minister of Industry and Trade and Minister of Labor and Social Affairs. The members of the Council are representatives of central and local government authorities, social partners, NGO's and academics.

The SDS **provides information to government bodies** and generally **summarizes the key issues, problems and possible solutions**. It is not aimed at imposing specific measures or replacing departmental and cross-cutting strategies, but rather at supporting their long-term orientation and mutual links.

Together with the adoption of the SDS of the Czech Republic there was adopted a resolution giving the relevant bodies of the Government Council of Sustainable Development an assignment to prepare and submit **a framework for implementing the Strategy into praxis**.

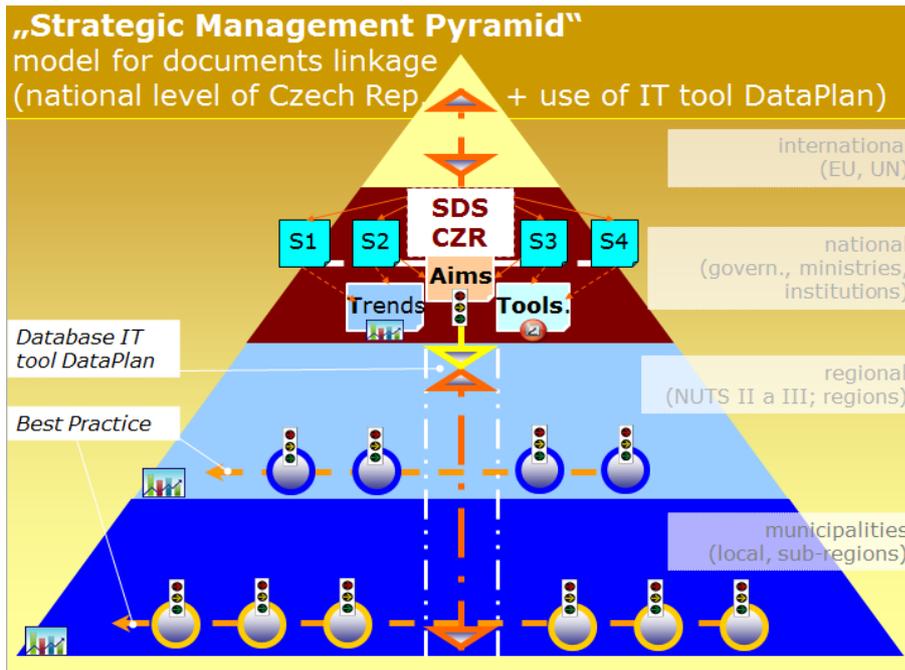
A special Working Group on Implementation of the SDS was established and its representatives, covering several ministries and other national institutions but also municipal associations, prepared a consensual document that emphasis on the procedures in individual levels of public administration and on the linkage among individual levels, which are:

- international (vertical level – in relation to strategic documents of the EU and int. institutions);
- national (horizontal level – in relation to strategic documents on the national level);
- regional (vertical level – in relation to strategic documents of regions and municipalities)

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<sup>5</sup> The Government Council for Sustainable Development (the "Council") was established by Government Resolution No 778 of July 30, 2003 as a standing advisory, initiative and coordinating body of the Government of the Czech Republic in the domains of sustainable development and strategic management.

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Source: CZR Implement SD Strategy\_SummaryReport.PdF

From the legal point of view, individual departments, regions, cities and municipalities should: (1) to respect the SDS CZR priorities and objectives within respective departmental, regional and local strategic documents (newly created or updated); (2) to perform an evaluation of accordance with SDS CZR priorities and objectives within the framework of strategic documents' preparation (i.e. binding governmental documents, departmental, regional and local programs and plans etc.). More on the topic can be found on: [http://www.mzp.cz/en/czech\\_republic\\_strategy\\_sd](http://www.mzp.cz/en/czech_republic_strategy_sd).

In 2015, representatives of the Department for Sustainable Development under the Government Council have started to amend the SDS frame and are working on mastering the CR key focus areas for the period up to 2030, where the Czech priorities will be matching those global ones approved at the UN summit hold in September 2015, and listed in so called Agenda 2030, stating 17 sustainable development goals. On 1 January 2016, the 17 Sustainable Development Goals (SDGs)<sup>6</sup> of the 2030 Agenda for Sustainable Development officially came into force.

A situation report on Sustainable Development (a Strategic Frame) from 2016 is showing the latest data on that issue (in Czech).

<sup>6</sup> The SDGs **are not legally binding**, governments are expected to take ownership and establish national frameworks for the achievement of the 17 Goals. Countries themselves have the primary responsibility for follow-up and review of the progress made in implementing the Goals, which will require quality, accessible and timely data collection.

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## Agenda 21

**Agenda 21** is a non-binding, voluntarily implemented action plan of the United Nations with regard to sustainable development.<sup>[1]</sup>

It is an action agenda for the UN, other multilateral organizations, and individual governments around the world that can be executed at local, national, and global levels.

“Místní Agenda 21 of the Czech Republic“ (LA21/MA21) is an official methodology to support public administration within the country, and one of its goals is to monitor key processes focused on the sustainable development at local levels (i.e. cities, regions, villages, micro-regions). Based on the Agenda 21, the LA21/MA21 supports an active communication with public, strategic planning and offers a wide range of public administration tools to public (e.g. financing). The municipalities engaged in the MA21 are rated according the MA21 criteria on a regular basis. Most of the municipalities are engaged in a “Health Cities National Net<sup>7</sup>”. Actually, there are 134 municipalities registered in the MA21 database. More on the topic can be found on: [http://www.mzp.cz/cz/mistni\\_agenda\\_21](http://www.mzp.cz/cz/mistni_agenda_21).

## Czech Environmental Information Agency CENIA

**CENIA, the Czech Environmental Information Agency**, is an agency of the Ministry of Environment. CENIA mission is the collection, evaluation, interpretation and distribution of environmental information. CENIA manages the integrated system of reporting obligations **ISPOP** <http://www.ispop.cz>, which ensures compliance with legislated mandatory reporting of environmental data while providing cross-cutting environmental information. CENIA manages mapping services Public Administration Portal <http://geoportal.gov.cz>.

In the Czech Republic CENIA is the focal point of the European Environment Agency (EEA)- and is involved in the European Information and Observation Network Environment Eionet.

**CENIA provides eco-label Environmental friendly product / service and the EU Eco-label<sup>8</sup>.**

<sup>7</sup> HCCZ is presently the only association of Czech municipalities that stipulates in its statutes to consistently work towards sustainable development, health, and the quality of life in cities, municipalities and regions of the Czech Republic.

<sup>8</sup>The EU Eco-label logo takes the form of stylized flowers (because she used often nicknamed the Flower / Flower) with a green stem and round inflorescence formed blue stars and € symbol in the middle. An integral part of the brand is a stylized inscription EU Eco-label.

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Eco-labeling program of the European Union is governed by rules in the Regulation of the European Parliament and the European Council following the principle of international standard ISO 14024.

In the Czech Republic as an intermediary for the award of the EU takes CENIA<sup>9</sup>. CENIA virtue of its role also involved in the revision of the criteria for awarding the EU Eco-label and may thus affect their appearance - and based on the comments of existing eco-label holders and other stakeholders including the public.

Eco-labeling process is described in the rules on the implementation of the National program of labeling environmentally friendly products and services issued by the Ministry of the Environment.

Czech eco-labeling program is part of the program Czech Quality. Czech quality program of support is selling quality products and providing quality services supported by the Government of the Czech Republic.

Czech eco-labeling program is a member of GEN - Global Eco-labeling Network<sup>10</sup> - represented by the Ministry of Environment and by CENIA. More information on environmental labeling, green household and other reliable labeling, green shopping, green office, green hotel and eco – label index can be found on CENIA pages.

## Integrated control system for reporting compliance environment ISPOP

Integrated control system for reporting compliance environment (ISPOP) was established by Law no. 25/2008 Coll., On the integrated pollution register and integrated system of reporting obligations in the field of environment and amending certain laws.

Legislation obliges reporting entities to report public administration information about the impact of their economic activities on the particular environment. This is the information

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<sup>9</sup> Lists of designated goods and guidelines with the relevant requirements and more detailed information for consumers on the one hand, and the manufacturer and dealer on the other side can be found on CENIA pages.

<sup>10</sup> GEN is a non-profit non-governmental organization, which was founded in 1994 in order to obtain information about all existing eco-labeling program and the subsequent unification of relevant environmental criteria and procedures. In this Global Network of eco-labeling are associated with various national and international programs from around the world. At present, it consists of 26 members and two other associates. The Czech Republic is a member since 2000.

about the pollution of air, water, soil, production and management of waste, the waste electrical and electronic equipment, car wrecks, and also information on operated facilities for waste treatment. Reporting is done electronically through ISPOP ([www.ispop.cz](http://www.ispop.cz)) or a data mailbox Ministry of Environment. ISPOP was launched 5. 1. 2011. Its founder is the Ministry of Environment. The operator of the system is CENIA.

## Environmental education and awareness (CEPA)

The crucial document of the a.m. topic is to be the **Sustainable Development Strategy of the Czech Republic on Education**.

In 90s the leading role at the “state” level has come to play the a.m. CENIA supported by the Ministry of Environment and the Ministry of Education, in 2011 a new National Institute of Education was established to enhance the educational activities.

Of course, other ministries are also engaged, e.g. the Ministry of Health and the Ministry of Agriculture among others.

As regards institutions at the public level, the regional authorities occupy the top position (employing specialists on environmental education) followed by school and/or other educational institutions, non-profitable organizations included. More on the topic can be found in the report: Environmental Education After 89s (in Czech).

## RIA<sup>11</sup> (Regulatory Impact Assessment)

The European Commission introduced an impact assessment system in 2002, integrating and replacing previous single-sector type of assessments. In the European Commission perspective, Impact Assessment (IA) **is a process aimed at structuring and supporting the development of policies**. In 2005 and 2006 the Commission updated its approach to include economic, social and environmental dimensions, thus moving in the direction of Sustainability Impact Assessment.

Regulatory impact assessments pursuant to Government Resolution no. 877 dated August 13, 2007 became a mandatory part of any legislative materials submitted to the Government of the Czech Republic. RIA process includes a set of methods for the systematic evaluation of negative and positive impacts of proposed or existing legislation. More on the topic can be found on:

<http://www.mvcr.cz/clanek/hodnoceni-dopadu-regulace-ria.aspx>.

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<sup>11</sup>The role of an RIA is to provide a detailed and systematic appraisal of the potential **impacts of a new regulation** in order to assess whether the regulation is likely to achieve the desired objectives. The report was prepared in the framework of the project “Prospects of the Visegrad cooperation in promoting a sustainable consumption and production model“ The project is supported by the International Visegrad Fund <http://visegradfund.org/>

## State Politics on (Living) Environment

The State Politics on (Living) Environment is in fact an Environment Protection Plan (in Czech) of the Czech Republic for the period 2010 – 2020. The aim is to ensure healthy environment of a high quality standard for all the citizens living in the Czech Republic, to support an effective use of resources and to minimize negative impact of human activities on environment (also those outside the country borders) and to help to improve the living standard in Europe and in the whole world.

Being a member of EU, the Czech Republic follows the obligations approved in the environmental EU legislation and is an active and reliable partner to discuss new legislation and other strategic documents dealt in the EU structures.

The basic purpose of the SEP is to provide guidance for decisions and activities at the international, national, regional and local levels aimed: (1) to achieve further improvements in the quality of the environment as a whole and the state of its components and parts, (2) to apply the principles of sustainable development in accordance with Czech and European strategies for sustainable development and the continuing integration of environmental considerations into sectoral policies and (3) to increase economic efficiency and social acceptability of environmental programs, projects and activities.

There are several important information systems related to issues on Environment:

- Assessment of the environmental impact (EIA)
- Strategic Environmental Assessment (SEA)<sup>12</sup>
- Waste Management Information System<sup>13</sup>

More detailed information on those can be found on: [cenia.cz](http://cenia.cz).

An excellent help on environmental issues can be obtained from the Environmental helpdesk (EnviHELP) - an information system designed to provide information from selected areas of the environment. EnviHELP was launched 9. 1. 2012. Its founder is the Ministry of Environment. Operator system is CENIA, the Czech Environmental Information Agency.

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<sup>12</sup>Both governed by Law [no. 100/2001 Coll.](#) The purpose of this process is to **identify, describe and evaluate the effects of assessed plans and policies** on the environment and public health in all crucial respects. SEA is designed for the needs of public authorities acting as the competent authority according to the Law on the assessment of environmental impacts in the SEA.

<sup>13</sup>Waste Management Information System is a comprehensive nationwide database and information system containing data on waste and on packaging.

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In addition to support reporting to the Information reporting compliance system (the a.m. ISPOP), there is another agenda, such as REACH, waste management, IPPC etc. Please, see below.

## CLP Regulation<sup>14</sup>/REACH<sup>15</sup>/Integrated Pollution Prevention<sup>16</sup>/Register

The a.m. register and the regulations legally approved by the EU authorities were implemented into the Czech Legislation, as well.

Here, we focus only on the Integrated Pollution Register as it deals with the “waste” issues that were described in our previous report.

In the IRP there are registered **93 different pollutants**, which are being monitored in all types of releases and transfers (in kilograms per calendar year). Functioning IPR currently governs a separate piece of legislation, Law no. 25/2008 Coll., on the integrated pollution register and integrated system of reporting obligations in the field of environment. Interesting data on the issue can be found on the website of the IPR - [www.irz.cz](http://www.irz.cz)<sup>17</sup>. Data are searchable by region, environmental components, industrial activities etc. All the data on discharges and waste are related directly to a specific organization, respectively. More on the issue and competences on: <http://www.irz.cz/node/211> (in Czech).

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<sup>14</sup> The purpose of the CLP Regulation is to ensure a high level of protection of human health and the environment and the free movement of chemical substances, mixtures and certain specific articles.

<sup>15</sup> The purpose of this regulation is to ensure the effective functioning of the common market for chemicals, protect human health and the environment from the adverse effects of chemicals. European Chemicals Agency will manage the technical, scientific and administrative aspects of REACH.

<sup>16</sup> Integrated prevention is a set of measures aimed at preventing pollution, reducing emissions to air, water and soil, to reducing waste and recovery of waste in order to achieve a high overall level of environmental protection.

<sup>17</sup> Integrated Pollution Register (IRZ) is governed by the Ministry of Environment (<http://www.mzp.cz/>) and serves as the information system of public administration, provider of which is CENIA. (<http://www.cenia.cz/>).

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## CHAPTER 3

### Sustainability of textiles in brief and with a positive outlook

#### Consumer Awareness

Sustainable consumption and production is one of the fundamental prerequisites for achieving sustainability. The “Textile” phenomena is an important part of both having a strong impact on environment - accounting for between 2 and 10% of total environmental impact (just after food, transport and housing). More information on: EIPRO REPORTS.

The precise environmental impact of textiles varies significantly depending on the type of fiber the garment is made from and production systems applied (there are four main factors: raw material extraction, textile production, added chemistry and end-of-life-cycle.).

All the actors along the supply chain have a role to play in reducing the environmental footprint of textiles.

Currently, producers and retailers are those, who are mostly driving the improvements in sustainability of textiles and are also working at raising **consumer awareness**. There is growing attention towards not only social, but also **health and environmental impacts** of textiles.

Extreme use fabrics (e.g. sportswear or hospital-use textiles) or flame retardant textiles represent a danger as they are using chemicals hazardous to human and environmental health.

Some governments have begun taking an action: product flammability standards are now undergoing review in several countries and some of them are to be banned globally.<sup>18</sup> To confirm such a trend, labeling(s) on sustainable textile production has been launched to offer a positive textile industry outlook:



<sup>18</sup> More information on: <https://www.theguardian.com/sustainable-business/sustainability-performance-textiles-wool-environment>.

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The STeP certification offers companies in the textile industry a modern, dynamic and transparent way of clearly documenting their sustainable commitment to the public.



The Global Organic Textile Standard<sup>19</sup> (GOTS) is a comprehensive fiber certification program developed by leading standard setters in order to define internationally recognized requirements. It sets the stage for many of the new technologies being developed today. The standards ensure “organic status of textiles, from harvesting of the raw materials, through environmentally and socially responsible manufacturing up to labeling in order to provide credible assurance to the consumer.”

### Textile research and sustainability

In Czech Republic the textile research has long-term tradition. Here arisen the world-known patents for OE spinning and jet weaving, unique technologies and machines for rotary screen printing, nonwovens of type Arachne, knitting machine of small diameter with individual selection of needles and fully automated spinning mill. From newer successful patents, which were already realized in new textile machines and devices it is possible to mention technology STRUTO (TUL Liberec), special weaving technique (VUTS Liberec Co.) and new principles of spinning (VUB Ústí nad Orlicí). Recent development in industrial scale production of nanofibrous assemblies by patented needle less technology is realized by unique machinery “Nanospider” PRODUCED IN Czech Republic.

In area of PAD fibers the team, in which worked academician Wichterle patented with success a lot of more efficient solutions dealing with industrial polymerization. Long term activities in the area of POP fibers and modified polyester fibers were important for achievement of sustainability in this field.

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<sup>19</sup>More information on GOTS can be found on: <http://global-standard.org/>.

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Workers of VÚP Brno proposed and realized the integrated fabrics a lot of years before top American company DuPont began to manufacture analogue product COOLMAX. At the present time are produced the fabrics of this type based on original patents by successful Czech company MOIRA. In recent time, the applications of side light emitting polymer optical fibers linear composites with special textile layer for clothing purposes and for low cost line lighting systems are patented and prepared for industrial applications. This incomplete listing reflects special position and persisting reputation of our republic in the world textile community.

For future development oriented to the sustainability it will be necessary to have at disposal new research results. These results should follow the strategy of “Industry 4.0” system especially in the industrialization of internet, utilization of big data and smart factories of future. Industrialization of internet is in the field of textile and clothing industry already realized. Plenty of industrial machines are now connected via internet with machinery producers which facilitate the adjusting, checking and control on line. The trend in clothing is so called co-design of clothing where customers are active in designing and trials are realized by virtual reality. Data mining in big data bases are used for comparing of textile products, selection the suitable customers and prediction of sustainability. The factory of future concept is essentially connected with new eco, energy and society friendly technologies and products.

The main aim of so called “Fibrous Material Engineering” are research activities in the following areas: technical design of textile products based on the physical and statistical models and big data mining, characterization of textiles structure and properties by using modern techniques (e.g. image analysis), quality control of the textiles and production processes, advanced application of textile assemblies (composites, technical products etc.), intelligent and sustainable textile structures design fabrication and testing.

Long-term research programs of Czech academic research are oriented above all to *basic and applied scientific achievements* in areas of design and optimization of textile structures, designs of textile machines including use of mechatronics and related technologies, product innovations of higher order for special protective fabrics and use of new materials for design of special sensors and sensors on clothing. The four main projects solved at the Textile Faculty are:

### **Optimum designs of textile products**

Nowadays, in the textile branch, there exist on the one hand a number of empirical pieces of knowledge and on the other hand a number of model solutions. Within long term investigation at textile faculty a system of particular partial knots within the textile formation was created and interconnection into the system of fibre-yarn-fabric was ensured. Within this project an optimum production process, including raw materials, designs, are searched from the pre-selected target properties of textiles and other

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restrictions in the design or production technology will be realized.

Information from existing materials and programs or models from the system of projecting textile structures are used. The principles of soft modeling and big data mining are adopted and a solution is searched as a compromise regarding the required target function. Output of the investigation will be a complex computer system for optimizing the design of textiles considering the specified requirements. Expected benefit will be namely in the design of special textiles and the acceleration of the process of proposing textiles. The system will be adopted for co-design of clothing in interaction between producers and customers.

### INVESTIGATION STAGES

- Modeling the special properties of textiles, transport behavior, interactions with gases or liquids and influence of various external physical fields.
- Databases of type products and their properties created in accordance with big data concepts.
- Creation of stochastic models on the basis of neuronal nets and non-linear methods for dimensional reduction (Independent component analysis, SOM etc.).
- Using genetic algorithms and heuristic searching for the determination of compromise solutions.
- Spatial variability prediction in the surface, 2D spectral analysis, autocorrelation function and variogram. Connection of properties with geometrical unevenness. Quantification of appearance.
- Creation of program system connected with internet and its modification for typical and new textile structures.

### Textile sensors and sensors for textiles

The part of smart-intelligent textiles for special purposes (military, medicine, astronautics, etc.) are miniature sensors continually monitoring both the physical condition of persons (e.g. breathing, heart beating, temperature and skin humidity) and acting of the environment on those persons (occurrence of various gases and toxic substances, humidity, temperature, pressure etc.). In addition to an independent testing of the properties of particular isolated sensors it is also necessary to monitor their installation into textiles and their usability in dependence on time, the properties of environment and working load.

In addition to those „hard“ sensors, the „soft“ sensors appear interesting where are carrier either the whole fabric or textile formation (usually tape).It concerns the various types of special systems containing chosen dyestuffs or other substances sensitive to the changes of the environmental conditions. This project is focused on the testing of special sensors

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(temperature, humidity and chemicals) considering their installation and functioning in textile structures. The application possibilities of special dyestuffs for UV radiation dosimetry or detection of bacteria and toxic substances will be investigated. The output of the investigation of the project will be the new principles of detection of physiological or other functions of human organism with the use of textiles and passive smart – intelligent textiles able of detecting both biological and chemical poison substances, i.e. substances endangering human health. Outputs will always be in form, which will enable an ease implementation into the industry.

### INVESTIGATION STAGES

- Studying the properties of sensors and their selectivity or limitations.
- The ways of installation of sensors into textile structures.
- Testing the usability of sensors considering the wear and maintenance of textiles.
- Selection, verification and testing of chosen dyestuffs and filters for the design of textile sensors changing color.
- Selection, verifying and testing of new types of sensors based on the nanotechnology principles.

### Textiles for special applications

The project is focused on product-oriented research and development of textile structures for three basic fields:

- Smart – intelligent textiles adaptively reacting and structures with controlled release of active substance in use in food-processing, chemical pharmaceutical, electronic industry and agriculture.
- Development of textiles from non-traditional or recycled raw materials for special fields of application (technical, domestic, building textiles).
- Development of designs of barrier textiles for packing materials and working clothing protecting against the effects of static electricity, chemical substances, radiation, thermal and flame effects, cutting through, weather and against ballistic impact.

In all the fields, complex research and development from the selection of fibers via yarn constructions up to final and special treatments are investigated. When investigating the points of views sustainability and ecology is regarded and the possibilities of the use of biotechnology for achieving special effects are investigated as well. As a relatively independent stage, reactive and non-reactive carriers of special effects and finishing means

are investigated. In special apparel textiles also the problems of their comfort is solved. The output of the investigation of the project will be new optimized textiles for special applications, textiles from new or recycled raw materials and ecologically saving processes of their preparation.

#### INVESTIGATION STAGES

- Evaluation of requirements for special textiles, recycled raw materials and fibers for special applications. Use of textile waste in green composites.
- Formation and optimization of the basic designs of special textiles regarding the use of new technological possibilities (e.g. NOVASPIN or ROTONA systems) and for final finishing.
- Studying the influence of the design of textiles on the basic properties and comfort of textiles in view to the purpose of their use.
- Search and verifying of biotechnologically and ecologically oriented technologies. Production technology optimization inclusive the investigation of the problems of recycling, waste and environment.

#### Principles of active substances stabilizing on textile substrates

Contemporary, most of new textiles with special effects is implemented with the aid of special active substances which are to be suitably stabilized on the surface of textiles or into undersurface layers with securing the controlled release as the case may be. An example of such substances are various metal salts, vitamins, radioactive substances naturally, coenzymes supporting slimming, substances slowing ageing and many others. For those substances, suitable technologies of stabilization or encapsulation are to be chosen.

Attractive is the use of special energy resources (plasma, microwaves, laser, ultrasound, ozone) which can act also independently on the surface of textile substrates. For implementing those finish types, serious information based on a systematic research is absent in a number of cases. The project is focused on investigating the basic possibilities and stabilization principles of active substances on textiles with a possibility of using non-traditional approaches.

#### INVESTIGATION STAGES

- Research and testing of new procedures and processes of stabilizing active substances on the surface of textile substrates ensuring their special properties, controlled release or reactivity considering the achievement of new effects. Special focus will be on the possibilities of using encapsulation and special substances as are Poly(N-

isopropylacrylamids) - PNIPAAm able of passing from the wrapped form into the elongated form or various types of molecular containers (e.g. cyclodextrins).

- Research of the use of applying new principles or new energetic resources as are plasma, lasers, microwaves, ultrasound, ozone and electro-polymerization for the implementation of multifunctional and barrier effects on textile substrates or facilitation of stabilization of active substances. Also interactions of those energy resources with the surface and the influence of the orientation of polymer chains on surface changes will be investigated.
- Using the finishing (modification) of the surfaces of special textile structures (targeted corrugated non-woven structures) for stabilization of active substances.

### Eco-Innovations

As regards the Eco-Innovations related to Environmental Friendly Policies and issues on Sustainability, **the Czech Republic belongs among leading EU countries** in promoting eco-innovations **in environmental technologies** (the further governmental support to eco-innovation is planned for second generation biofuels, hybrid automobiles, membrane technologies for water filtration, decentralized management of water, automatic separation of secondary resources from waste, new materials for construction, and effective heat transfer).

The Czech companies' environmental awareness is much higher than EU average, particularly if we look at the number of firms acquiring the ISO 14001 certification related to observing environmental management requirements. In spite of a relatively high score in terms of eco-innovation activities, the Czech Republic **scores are low in the field of eco-innovation outputs** (eco-patents, EI publications and EI media coverage).

In general, Eco-innovations in the Czech Republic are mainly focused on the following areas: energy efficiency, environmentally friendly generation of heat and electricity, environmentally friendly motor transport, sustainable water management, effective waste management, resource efficiency and nanotechnology.

The main barriers in Eco-Innovations in the Czech Republic are:

- non-systematic and ineffective innovation support
- complexity of environmental legislation and inconsistency of its implementation (the same is for testing and implementation of eco-innovative technologies)

- weak cooperation activities among R&D institutions and Business entities
- absence of an interest group (cluster) representing the sector of eco-innovations and environmental technologies
- weak expert-based-structure for assessment and verification of environmental technologies, education strategies and further HR development

The actual policy approach is mainly focused on instruments like regulations and standards (on the “demand side”) and on the promotion of networks and partnerships, mainly by supporting clean-tech clusters and technology platforms, complemented by support for R&D activities (on the “supply side”). There are several programs<sup>20</sup>, e.g. the Program on Support of Environmental Technologies, The Operational Program for Environment (Ministry of the Environment) and the Operational Program for Entrepreneurship and Innovation (Ministry of Industry and Trade), ALFA, EPSILON that are focused on eco-innovations.

In 2013 the Government approved the updated **National Research, Development and Innovation Policy and the National Secondary Raw materials Policy**. One of the key objectives is “to ensure the allocation of funds to the implementation of national R&D&I priorities from the national budget and take into account priorities in all relevant targeted supporting programs”.

## CHAPTER 4

### Summary

As regards the legal frame issues – and not only in the relation to the sustainable growth - V4 countries should support the trend of „Environmental-Friendly Policies“ furthermore and strive for:

- Stabilization of Legal and Business Environment (free from corruption, undesired lobbying, unfair and/or non-transparent actions and policies etc.)
- Effective Processing and Functional Managerial Strategies carried out by Government and Public Administration Representatives
- Standardization in Technical, Consumer, Social and Ecological outcomes

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<sup>20</sup>More information on: [www.eco-innovation.eu](http://www.eco-innovation.eu) .

- Businesses and Government Motivation turned to “Environmental-Friendly” R&D research activities<sup>21</sup> and Business Share on those through interdisciplinary co-operation with R&D entities
- Permanent Monitoring of Business Environment aiming at “the right” prioritizing (reconstruction of existing industrial sites, “synergies” in technological and capacity investment, relocation issues due market/political/social changes etc.) and at general “legal” adhesion (not only) in the relation to Environment
- Environmental Education Enhancement

## References

### Useful links:

- [http://sustainabilityskills.net.au/wp-content/uploads/2012/07/Sustainability-issues-in-textiles\\_June12.pdf](http://sustainabilityskills.net.au/wp-content/uploads/2012/07/Sustainability-issues-in-textiles_June12.pdf)
- [http://www.ifm.eng.cam.ac.uk/uploads/Resources/Other\\_Reports/UK\\_textiles.pdf](http://www.ifm.eng.cam.ac.uk/uploads/Resources/Other_Reports/UK_textiles.pdf)
- [http://ec.europa.eu/environment/industry/retail/pdf/issue\\_paper\\_textiles.pdf](http://ec.europa.eu/environment/industry/retail/pdf/issue_paper_textiles.pdf)
- <http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/introduction>
- Research for Sustainable Development: [/research/sd/index\\_en.cfm](/research/sd/index_en.cfm)
- European Sustainable Development Network (ESDN): <http://www.sd-network.eu/>
- UN Commission on Sustainable Development (CSD) [link: [http://www.un.org/esa/dsd/csd/csd\\_aboutcsd.shtml](http://www.un.org/esa/dsd/csd/csd_aboutcsd.shtml)]
- Publication of a Handbook for the Peer Review of National Sustainable development Strategies
- Commission Communication "On there view of the Sustainable Development Strategy - A platform for action" COM(2005) 658
- Final Commission Communication "Draft Declaration on guiding Principles for Sustainable Development" COM(2005) 218 final, 25.5.200
- Commission Communication "The 2005 Review of the EU Sustainable Development Strategy: Initial Stocktaking and Future Orientations" COM(2005) 37, 9.2.2005
- The European Commission sets a positive agenda for the 2005 review of the Sustainable Development Strategy (press release IP/05/156 of 09/02/2005)
- Commission Communication "The World Summit on Sustainable Development one year on: implementing our commitments" COM(2003) 829
- final Commission Communication "Towards a global partnership for Sustainable Development" COM(2002) 82 final, adding a global dimension to the EU Sustainable Development Strategy
- ESDN site on national SD strategies

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<sup>21</sup> The government appropriations and outlays into environmental and energy R&D reach 2.6% of GDP, which represents **only 61% of EU average** - more information on: [www.eco-innovation.eu](http://www.eco-innovation.eu) .  
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