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**WORLD ENERGY COUNCIL**  
CONSEIL MONDIAL DE L'ÉNERGIE  
*For sustainable energy.*  
Slovenian Member Committee

**World Energy Council, Slovenian Member Committee**

and

**Energy Industry Chamber of Slovenia**

The third conference on the current state and future of energy  
Energy Policy Consideration

**EPC III**

***ENERGY POLICY CONSIDERATION – RAZMISLEK O ENERGETIKI***

*National Energy Roadmaps to 2050*  
*Nacionalni energetska kažipoti v 2050*

**24<sup>th</sup> April 2015**

**Conference Conclusions**

## CONCLUSIONS OF THE EPC III 2015 CONFERENCE

### Energy Policy Consideration

#### *National Energy Roadmaps to 2050*

**Ljubljana, April 24<sup>th</sup> 2015**

This year's conference under the main title Energy Policy Consideration has been directed towards the field of national energy policies and strategies, therefore the event was entitled National Energy Roadmaps to 2050.

Of course there are several possible paths for the implementation of national climate and energy goals. Hence, the duty of the Energy Concept of Slovenia (ECS) is to perceive and define these in a proper manner. The energy sector is undoubtedly changing fast. Furthermore, it is inseparably connected and interlinked with economic activities and markets, therefore this document will only be a reflection of the time, when it was drafted.

We are obliged to seek consensus in the energy field, but also to search for possibilities and to become more ambitious. This is the only possibility, if we want to actively participate in the process of climate and energy goals attainment within the framework of the European Union, but also when reconciling viewpoints towards our future within the framework of the COP 21 United Nations Climate Change Conference to be held in Paris this year.

The purpose of the conference is to collect the participant's opinions about the possible paths towards the goals, whereas ambitiousness must prevail over problems, which are not part of the national energy sector as a matter of fact, whereas find answers to the following questions:

- i. When, who and what must be done at national level?
- ii. What needs to be done by the energy sector in order to achieve the national binding climate and energy goals until 2050?
- iii. Proposal on the mechanisms, investments and incentives to be taken in order to attain these goals.
- iv. What are the advantages for costumers and the society?

28 speakers participated actively at the conference, where they held presentations. Their contributions discussed the following matters:

- a) European energy paths and the Energy Union
- b) Content and outline of the Energy Concept of Slovenia
- c) National energy aspects
- d) Regulatory frameworks to achieve national climate and energy goals
- e) Energy markets (sustainability, security, competitiveness, market models)
- f) Energy use and supply
- g) Energy networks (electricity, natural gas, district heating and cooling)
- h) New technologies and service development trends for efficient energy use

The conclusions of the conference are summarized as follows:

**General conclusions:**

1. It is of crucial importance to draft a new national energy development program (Energy Concept of Slovenia, hereinafter referred to as: ECS) in close cooperation with competent experts and the public. The program must cover all fields of energy policy equally, whereas also consider national binding climate and energy goals.
2. We have to pursue a higher level of energy independency and an appropriate diversification of energy sources (water, heat, nuclear, renewable energy sources (RES), what is most certainly a precondition for the highest possible reliability of energy supply in Slovenia.
3. We must build upon sustainable energy management actions in all fields, which must be based on renewable energy sources (RES) and efficient energy use (EEU) in order to reduce the unit energy consumption per GDP.
4. The potentials of renewable energy sources (RES) have to be assessed realistically, whereas technical-economic, ecological and sociological aspects have to be considered in accordance with efficient energy use (EEU). The state shall encourage such RES, including the energy potentials of municipal wastes, which under condition of economic viability contribute most towards Slovenia's energy independency and reduce the environmental burden. Furthermore, the technical aspect has to ensure such RES exploitation methods, which provide maximum energy efficiency, satisfy requisite ecological conditions and produce the lowest levels of emissions possible.
5. Privatization processes in the energy sector and a contestable energy market, which allows free choice of a supplier, must not reduce the investment activities in order to ensure quality and safety of energy supply, whereas the range of quality energy services must be improved.
6. Energy research must be entrusted to competent, scientifically and application-oriented established researchers, balanced according to the development scope and research contemporariness in all fields of the energy sector, thus systematically incorporated into the European Union's program at national level.
7. A sustained effort for the promotion of technical branches of study has to be undertaken, especially among young people, in particularly in the field of energy economics. Consequently, the trained experts have to be motivated adequately, convinced to prevail inside their field of expertise and develop technological products and services with higher added-value and environmental suitability.
8. Financing research (application-oriented and experimental) in the field of energy economics should be balanced in accordance with the development scope and research contemporariness in all fields of the energy sector. Proceeding from this, development-research work priorities for the improvement of the Slovenian energy sector's condition have to be defined. Moreover, this has to serve as a scientific basis for program and project financing.
9. The siting of energy infrastructure remains a problem, although it is of crucial importance for the development of our society, therefore sufficient attention

should be given to the regulation of such procedures and documentation. The state must enable a reasonable siting of energy facilities based on scientifically backed solutions, what will hinder the rejections of energy projects based on unprofessional arguments.

### **Concrete proposals and conclusions for different fields of expertise:**

#### **1. Energy policy and the Energy Concept of Slovenia (ECS):**

- Energy policy is one of the cornerstones of the national economy, therefore it requires prudent management.
- ECS is a selection of rules we have to abide in order to achieve successful development and is the fundamental development document of energy economics.
- Goals for reliable, sustainable and competitive energy supply for the period of the next 20 years and indicative 40 years are to be determined in accordance with the ECS and on the basis of economic, environmental and social development projections for the state and the adopted international obligations.
- ECS is a political document, which will not define concrete projects. Hence, market activities will have to seek and create efficient business models for the realization of the goals set by the Energy Concept of Slovenia.
- The public shall actively participate in discussions about the ECS, thus experts shall take final decisions on the energy economics guidelines.
- The existent energy system serves as a basis for further development. The system shall be modernized and upgraded with proven smart systems (New Energy and Industrial Technology Development Organization; NEDO).
- In future, particular attention will be paid to energy use in transportation. Slovenia spends 7 % of its GDP for the import of energy sources (40 % from this share are used in transportation only).
- The energy policy goals and guidelines are as follows: The energy efficiency has to be improved by at least 35 % until 2035, a 100 % low-carbon production has to be ensured by 2055, greenhouse gas emissions in transportation have to be reduced by at least 35 % until 2035 and 70 % until 2055, 100 % heating from RES and combined heat and power (CHP) in the field of district heating and cooling has to be assured and at least a 30% share of RES in end use by 2055. Furthermore, a 100% exploitation of sustainable potential of RES in the Republic of Slovenia shall commence (taking into account environmental and economic aspects), nuclear energy along with RES shall replace electrical power generation from fossil fuels in the future, whereas from 2055 natural gas remains the only fossil energy source in use.
- Applied science representatives shall be invited to expert discussions about the ECS.
- We should take advantage of our natural resources, therefore district heating and cooling and geothermal energy must be integrated into the ECS.
- National energy must be based on our national and geostrategic advantages.

## 2. Energy regulation – guidelines for an efficient and well-functioning market by 2025 and guidelines until 2050

- We have to continue to pursue activities for the establishment of an efficient and well-functioning domestic energy market in accordance with trends and guidelines set for the European Union until 2025. Furthermore, the development of a well-functioning retail market must be carried out for the benefit of the customers.
- Active cooperation of all stakeholders on the market at national level is crucial for the development of mechanisms for the improvement of energy supply in Slovenia and the management of external impacts on supply in the EU.
- The transition into a low-carbon society with a higher share of RES and with an adaptive and responsive supply with efficient exploitation of active, smart networks and new energy services must be incorporated as an important part of the energy policy.
- Establishment of dialog between interest groups, cooperation and drafting of new legislative regulations must be regularly harmonized with the European Union.
- When adopting and implementing the ECS and the National Roadmaps to 2050, we initially propose to define the goals according to the carried out expert discussion and identify all relevant fields and establish clear commitments towards stakeholders. This activity shall be followed by environmental and economic assessment of individual measures pursuant to specific periods of the concept, followed by a legislative basis with efficient supervision.

## 3. Electrical power and natural gas market

- The consumer has to become the centerpiece of attention. We are all together in the energy field due to the customers, thus we have to exclude individual interests.
- System energy suppliers need to understand, that individual energy economics will find its place within energy economics. This is acceptable, although they have to be separated.
- The challenges of the electrical power market shall be directed especially towards the regulatory field, for instance:
  - Renewable energy sources – an efficient scheme of operational support systems,
  - Classic sources – Capacity Remuneration Mechanism (CRM).
- Implementation of incentive mechanisms for the assurance of electrical power supply security to the market according to the legislation, such as the CRM.
- Sufficient infrastructure in the country in line with developments in the European Union and assurance of appropriate foreign-policy relations, especially with the Russian Federation as the one of the key European supplier, have to be ensured for a quality development and operation of the natural gas market, which is subject to geo-political circumstances.

- The energy market must be transparent and effective. Support schemes may not have an impact on it.

#### 4. Natural gas market:

- Fragmentation of national markets has to be reduced in order to achieve efficient operation of the market. The share of regulated burden according to the percentage of energy is too big, thus the energy source competitiveness is diminished.
- Development of dynamic products and services related to energy source supply shall be supported.
- Price formation models for energy sources must be entirely market-oriented.
- Uniform and effective regulation and supervisory mechanisms shall be established.
- Allocation of transmission capacities shall be conducted in accordance with the requirements of the market, new products shall be developed in accordance with the needs on the market.
- Development of smart networks and diversification of energy production must be promoted and included in the concept of energy self-sufficiency. Active gas and electricity networks must be functionally connected.
- Suppliers will lose their classic role and will have to offer additional/other services to the customers.

#### 5. RES and support schemes

- Financial stability of the support scheme is indispensable (increase of the existing contribution or introduction of new sources).
- First of all, distinguished/clear ‘game rules’ (only the Energy Act framework is known until now) concerning new entries into the support schemes have to be set in the future.
- Greater emphasis is to be placed on the ECS, what will also facilitate the achievement of the RES goals.
- Introduction of alternative mechanisms, which can, although with small steps, contribute to the attainment of energy goals (e. g.: net-metering).
- Support schemes shall be used as an ‘ointment’, not as a measure hindering further development of the energy market.
- Financial stabilization and harmonization of support schemes are indispensable. The question, how will these support schemes be funded, is still open, therefore it is arguable whether the objectives pursued are serious and realistic.

#### 6. Electrical power generation

- The state has to define long-term strategic directions (irrespective of energy company ownership). Without a long-term strategic direction, companies cannot recognize the key conditions for efficient future development, when planning their operations.

- The majority of the EU member states are already en route towards the modification and adaptation to emerging situations in the energy sector – pushing national energy companies into a difficult position, when competitors in some of the EU member states already successfully took advantage of some of the possible responses to market situations, provided by the state through appropriate legislation.
- Measures for the attainment of energy goals must consider all relevant national circumstances.
- When drafting the ECS, all relevant occurrences in the European energy market have to be considered and translated accordingly into measures at national level, especially from the perspective of supply security.
- The ECS must offer a foreseeable, realistic and trustworthy frame for the operation of energy companies – an appropriate support environment, avoidance of disproportionate burdens, improvement of siting process efficiency, a higher level of public acceptance towards necessary projects, etc.
- In order to draft a satisfying ECS, all relevant stakeholders have to cooperate. Furthermore, consensus within civil society, a high level of commitment towards the implementation of the energy concept and an open, clear and inclusive process for the possible preparation of modifications for the national legislation on energy have to be achieved.
- The ECS is a strategic and political decision based on expert evaluation of the necessary additional production facilities, a technologically neutral assessment of all technologies, sustainability balance and national interests.
- ECS must offer an optimum solution for the energy trilemma (security of supply, sustainable development, affordable energy).
- Slovenia is a recognized state with nuclear energy. The construction of a second block at the Krško Nuclear Power Plant is still in the early planning and preparatory phase. Challenges are well-known and manageable (security, funding, radioactive waste, public acceptance, etc.). The strategic/political decision-making process must be designed according to expert judgment and responsibility, thus it has to encompass all possible aspects – the beginning is expected for the next year.
- The national policy may help to resolve these challenges, whereas assuring environmental, economic, social and energy security justifies the effort needed for its implementation.

#### 7. Development of alternative fuel transportation in the Republic of Slovenia

- The Ministry of Infrastructure and Spatial Planning of the Republic of Slovenia will prepare a Strategy for the Development of Alternative Fuel Transportation in the Republic of Slovenia to be discussed at the Council of the Ministry in May 2015. An inter-ministerial working group will be formed in June 2015 and commence operation in the same month. The proposal for the Strategy for the Development of Alternative Fuel Transportation in the Republic of Slovenia is expected to be drafted until the first half of the year 2016.

- The state possesses all potentials for intensive introduction of alternative fuels in transportation and mobility.
- The Republic of Slovenia must actively participate in such developments in the region, follow regional initiatives and take advantage of the already existing inter-ministerial arrangements for the inclusion of this field.
- Alternative fuel transportation requires a strategic approach towards infrastructure planning (transportation, energy and logistics infrastructure).
- A systematic introduction of alternative fuel vehicles (electric, natural gas in CNG and LNG forms, biofuels and hydrogen) is necessary, as well as the identification and mobilization of suppliers of these and related service activities.
- Mechanisms for the development of such mobility, but also financial and other incentive measures have to be developed.

#### 8. Electrical transmission network – SOPO

- The transmission network of Slovenia provides an extraordinary strategic location, which assures access to key European markets and international trading. Transit reduces network charges, whereas higher possibilities for import and export improve/stabilize electrical power prices in Slovenia. Yet, the main dilemma for the future remains into which direction, how fast and how to increase our import-export capacities.
- Opportunities for import and export will arise with the implementation of long-term goals, whereas both doors have to stay equally open. Cross-border investments must follow developments in the neighboring systems.
- In fact, the development of mechanisms for the allocation of cross-border capacities (NTC) is entering its crucial phase, which could have an impact on the trading volume limitations at Slovenia's borders (flow based). Therefore, someone responsible for the development of mechanisms for the allocation of cross-border capacities must be determined.
- After abolishing the problem of big areas with a unified price, all possibilities for a revolution in the field of cross-border trading will arise. (Contest on the border → Contest between borders).
- Slovenia's long-term goal must be to maintain or even improve its today's position.

#### 9. Electrical distribution network – SODO

- The energy concept shall pay particular attention to the users/customers and their needs. Therefore, the concept will be proven successful, when users anywhere in Slovenia will be entitled to the same level of services.
- The distribution network concept has to be adjusted according to different types of customers (static or dynamic customer). A static customer is today's customer, whereas the dynamic customer takes advantage of the network's possibilities and technologies. It is crucial that the customer is informed about the implementation of new technologies.

- With new investments, the distribution systems becomes “smarter”, hence investments shall be balanced according to the geographical position, as well as other elements of the distribution system (network elements and information systems) – risk of a weak link.
- The distribution infrastructure shall ensure safety of energy supply and simultaneously data accuracy and transparency to all stakeholders, who are planning system developments and supply offers or services in the electrical distribution network.
- The development of active networks must be systematic and conceptual, thus a national development and implementation strategy has to be drafted. The carrying out of the national development and implementation strategy for smart networks must be implemented within the framework of development plans provided for in the Energy Act and included into the regulatory framework as determined by the regulatory body (Energy Agency).
- Means for the realization of technological solutions shall be provided out of research funds and similar projects. Moreover, the realization of the projects has to be included into the development plans. These have to be implemented according to regulatory practices, therefore follow economic principles. Their implementation must be defined with a strategic document, as it has to be a part of the development plans.

#### 10. Natural gas transmission network – OPS

- The natural gas transmission network must support the development of natural gas use in the country, whereas be reliable and secure. As a part of the pan-European transmission network it has to enable the operation and development of the natural gas market, thus ensure all criteria of operation reliability and security.
- The Slovenian transmission network must follow international natural gas connections and projects in order to ensure diversification of supply sources and transmission pathways.
- Slovenia possesses an enormous development potential for the expansion of natural gas supply and connection to the gas transmission and distribution network in the country.
- Integration and closer cooperation between natural gas system operators at national, regional and local level, as well as the integration of isolated systems, causing natural gas islands to emerge, have to be encouraged in order to establish a competitive natural gas market. Cooperation shall cover in particular harmonization between legislative and technical frameworks, especially in the field of data exchange.
- The implementation of new technologies must contribute to the technologically and economically most optimized transmission, distribution and use of natural gas. Transmission and distribution must uniformly be carried out for the benefit of the users.

- A system for the connection of new users of compressed natural gas (CNG) vehicles must be established, whereas associated suppliers and service providers attracted.
- The ‘virtual gas pipeline’ is a potential model for the introduction of gas pipeline networks. Furthermore, the natural gas system shall adjust its infrastructure to all natural gas types (CNG, LNG and biogas) in accordance with demands and possibilities.
- Technologies and processes for the benefit of the user have to be implemented, enabling him to not only be an active consumer of gas, but also other energy sources.
- Slovenia must actively participate in the Union’s drafting of market models, especially in the region and implement these for the benefit of the user.

#### 11. Natural gas distribution network – ODS

- Development of the gas infrastructure and sector must be oriented (short-term and long-term) towards competitive supply with sustainability in the foreground, since natural gas as an energy source enables us to attain energy and climate goals.
- All hindrances due to subsidy policies should be removed, this means that the Eco Fund, Slovenian Environmental Public Fund, shall grant subsidies outside of areas with already built district heating systems, preventing unfair competition and stimulate the users towards an economic utilization of the existent infrastructure. Furthermore, the Eco Fund shall also grant subsidies for efficient gas appliances yet to become prevalent (e. g. gas heat pump) and until now not eligible for subsidies. These devices could substantially reduce energy consumption, whereas introduce renewable energy sources.
- Modern gas technologies can significantly contribute towards the attainment of energy and climate goals (combined heat and power generation, fuel cells, gas heat pumps, CNG, LNG).
- Compressed natural gas (CNG) represents an alternative fuel within the EU, thus it should be introduced in Slovenia as soon as possible. Slovenia has dropped behind in this field and still lacks a suitable strategy for its implementation. Furthermore, CNG is yet to be recognized as a subsidized alternative fuel in Slovenia.
- For the development of a sustainable transit freight transportation in accordance with examples of good practices and objectives within Europe, a system of refueling stations, which will supply heavy goods vehicles in the Republic of Slovenia with liquid natural gas (LNG), as probably the only realistic alternative fuel in freight transportation until 2035, has to be established as soon as possible.
- The existent infrastructure should be utilized accordingly, preventing infrastructure duplication (natural gas – district heating and cooling) and costs due to construction and management.
- According to examples of electrical power generation, production of renewable methane for injection into the gas system shall be encouraged.

- Regulatory policy shall be harmonious and balanced with the energy policy – the regulatory body on one side demands higher exploitation of the network, whereas the energy policy with its measures (subsidies, support schemes, etc.) and regulations follows contrary goals.

#### 12. District heating and cooling systems

- Business models of multi-utility services induced positive results and therefore have to be developed at an accelerated pace and also stimulated in Slovenia.
- Harmonization and balance of public calls for the allocation of financial incentives for the implementation of the RSE measures has to be ensured with the purpose to confine economic unjustified migration of customers, who are already connected to district heating systems. High-efficiency technologies (CHP devices) should be actively incorporated into district heating and cooling systems. For the moment, terms of calls for the incorporation of high-efficiency technology production into the supportive schemes for CHP are yet to be determined.
- District heating and cooling operators expect an efficient regulation of distribution prices, which will ensure competitive services for customers, while simultaneously enable a long-term and sustainable scope of district heating and cooling activities, operational safety and further development of systems. It is expected that district heating and cooling will find a suitable place within the ECS and present an important cornerstone of the Slovenian energy sector in the future. Furthermore, the development of a European strategy for district heating and cooling, European Heat Strategy (2015), enjoys support at EU level.

#### 13. Energy network technologies

- The Slovenian industry urgently requires a polygon for the testing of smart network solutions. Demonstration projects, also international (e. g.: Slovenian-Japanese cooperation), need a systematic approach and leadership.
- Smart networks are a preliminary condition for the inclusion of renewable energy sources and efficient energy use. By establishing smart networks, investments into the distribution network can be reduced on a long-term basis.

#### 14. Development of new services for the customer

- The distribution system and services should be adjusted to the needs of the customer. Commercial public services shall be in the service of the customer. Therefore, a harmonious development between commercial public service providers of the entire distribution system in the Republic of Slovenia is expected.
- Distribution supervisions or distribution units represent the basic for customer relations. Data and information for the customer and the supplier should be provided through a uniform entry point.
- Energy infrastructure should be used in order to overcome telecommunication gray patches.

- Market services of energy management with the customer and for the customer shall be developed.
- Quality of supply shall be compared with quality of supply parameters within the EU.
- Funding for network and service upgrades may be provided through rational and efficient management of the distribution network.

#### 15. New technologies and services

- The ECS must serve as a development concept for other Slovenian economic sectors and be entrusted to politically independent Slovenian experts, recognized abroad, and the Slovenian industry.
- New technologies that rely on natural gas should be encouraged as they contribute to a higher usage and utilization of the network infrastructure. Furthermore, relevant incentives should be adjusted to this.
- The remote energy sector shall introduce modern concepts with a higher number of smaller trigeneration solutions, open the market for source diversification into the systems and introduce new products (e. g.: cooling, renewable heating, incineration plants, biogas production, etc.), but also new engineering services home and abroad. Furthermore, the state, market representatives and the energy sector should go hand in hand and contribute to the development of economic-energy islands with wood biomass / wood biomethane, geothermal energy and other RES.
- With the expansion of supply sources, assurance of autonomy and establishment of a reserve, natural gas (wood biomethane) shall be exploited for cooling, road transportation, mechanization and even transportation by railway.
- Cooling must be considered in all national strategic documents equivalently.
- A revision and modification of the local energy system concept is an urgent matter. Progressive restructuring of bigger systems into smaller, more efficient and diversified trigeneration systems, propelled by different energy sources, shall take place (enormous systems with just one source are history of the 20<sup>th</sup> century).
- The biggest Slovenian towns (Ljubljana, Maribor) have enough potential for municipal waste incineration plants (beforehand the best possible recycling management has to be ensured).
- Utilization of agricultural land for bio fuels, usage of extra light fuel oil for the heating of buildings, industrial premises and remote energy, and the exploitation of fossil fuels for heating shall be forbidden.

#### 16. Environmental suitability of the energy sector

- The strategy of the Government of the Republic of Slovenia for cooperation with non-governmental organizations (NGO) must be defined in the spirit of good friendship.
- Decision-making processes must allow public participation. Furthermore, clear rules of public cooperation must be determined. The public must be duly

informed about the processes and included in the earliest possible stage of the process.

- Access to all important documents related to individual processes must be allowed. Furthermore, everyone must be given the opportunity to submit his own contribution, opinion or comment. Public assessment of the submitted contributions, opinions and comments must be provided at all stages.
- Decision makers must guarantee independent facilitation of all processes.
- Final decisions must be made public.

This summary of conclusions is based on suggestions from 28 contributions, provided by the speakers and co-authors of the content at the conference: Franc Žlahtič, Marjan Eberlinc, Violeta Bulc, Peter Gašperšič, Alberto Pototschnig, Einari Kisel, Jean-Michel Glachant, Sylvia Elisabeth Beyer, Vittorio Musazzi, Damjan Međimorec, Danijel Levičar, Alojz Poredoš, Irena Praček, Robert Golob, Karlo Peršolja, Djordje Žebeljan, Martin Novšak, Jože Špiler, Matjaž Vrčko, Franc Cimerman, Uroš Salobir, Matjaž Vodušek, Urban Odar, Dejan Koletnik, Mojca Kert, Igor Papič, Igor Šalamun, Andrej Kitanovski, Karel Lipič and Urška Dolinšek, but also incentives suggested in the questionnaires completed by the following conference participants: Franko Nemas, Peter Novak and Karel Lipič.