



ALPINE CONVENTION

# Towards Renewable Alps

## A progress report

for the period 2015-2016



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**ABBREVIATIONS**

CHP:	Combined heat and power
COP:	Conference of the Parties
EEG:	Erneuerbare-Energien-Gesetz (Renewable Energy Sources Act), Germany
EPBD:	Energy Performance of Building Directive, EU
ESG:	Energieeffizienzstrategie Gebäude (Energy Efficiency Strategy for Buildings), Germany
EU:	European Union
EUSALP:	European Union Strategy for the Alpine Region
FIT:	Feed-in tariff
GHG:	Greenhouse Gas
GJ:	Gigajoule
GW:	Gigawatt
GWh:	Gigawatt hour
kWp:	kilowatt peak
LTECV:	Loi relative à la transition énergétique pour la croissance verte (Energy Transition for Green Growth Act), France
Mtoe:	Million Tonnes of Oil Equivalent
MW:	Megawatt
NAPE:	Nationaler Aktionsplan Energieeffizienz (National Action Plan on Energy Efficiency), Germany
PJ:	Petajoule
PV:	Photovoltaic
RES:	Renewable energy sources
SEN:	Strategia Energetica Nazionale (National Energy Strategy), Italy
SME:	Small and medium-sized enterprise

# 1. Background: The Renewable Alps vision and its role for the Alpine Convention

## Background: Launch of the Energy Platform by the XII<sup>th</sup> Alpine Conference

The Energy Protocol of the Alpine Convention was signed in 1998. Subsequently, several studies and guidelines were produced by the Convention's working groups and platforms, such as the hydroelectricity study by the Water Management Platform<sup>1</sup>. A common sustainable energy strategy in the Alps was declared a priority for the Alpine Convention at the XII<sup>th</sup> Alpine Conference in Poschiavo (September 2012) as well as by the organizers of the AlpWeek Conference 2012, which took place under the title Renewable Alps. The Alpine Conference confirmed the 'importance of addressing more strongly the topic of energy infrastructure in the Alpine region and the consequences in particular on the environment and landscape' and set up an Energy Platform for 2013-2014.

A specific mandate for the Energy Platform was agreed upon by the Permanent Committee during its 52<sup>nd</sup> meeting (Decisions PC 52/ B5/ 1-2). Specifically, the Energy Platform was commissioned to launch an exchange of experiences in the fields of energy production and energy consumption. Switzerland assumed the presidency of the Energy Platform.

## Energy Platform 2013-2014 under Swiss Presidency

The specification of the Renewable Alps vision was at the core of the Energy Platform's work programme. Under the Swiss Presidency, the Energy Platform discussed and developed activities along five major elements:

- Consumption: promoting efficient energy consumption strategies, especially in the building sector.
- Production: developing renewable energies according to sustainability principles.

<sup>1</sup>. "Alpine Signals Focus 1: Common Guidelines for the use of small hydropower in the Alpine region", Permanent Secretariat of the Alpine Convention (2011)

- Governance: continuing exchange on local and regional strategies for energy governance.
- EU interface: defining a European Energy System acceptable for the Alps.
- Knowledge transfer and innovation: strengthening knowledge transfer on sustainable energy systems in the Alps.

Consumption and production are the two core elements that shape the Renewable Alps vision. Governance, knowledge transfer and the definition of the EU interface are cross-cutting elements that frame both consumption and production strategies.

The Energy Platform operated on two levels: as a core group of experts and through expert workshops with a wider range of stakeholders. Three workshops focusing on energy production, energy consumption and energy distribution were organised in this period. An activity report, published in October 2014, summarized the Energy Platform's activities and provided an overview of the workshop results. It also defined specific decision proposals for the XIII<sup>th</sup> Alpine Conference.

### Confirmation of the vision and further steps

At the XIII<sup>th</sup> Alpine Conference in November 2014 in Turin, ministers welcomed the activity report of the Energy Platform and confirmed their willingness to develop the Alpine region into a model region for sustainable energy systems and thus to pursue the Renewable Alps vision. Several further steps were agreed upon: the third edition of the Constructive Alps competition, the organisation of a side event during the EXPO in Milan and a collection of best practices in energy projects as regards dealing with nature protection and land use issues.

The XIII<sup>th</sup> Alpine Convention mandated the Permanent Secretariat – with support of the Contracting Parties and of the Observers – to report on the progress towards the Renewable Alps vision at the XIV<sup>th</sup> Alpine Conference.

### Objectives of this report

This progress report shall give an overview of activities supporting the Renewable Alps vision. Section 2 gives an update on developments at national and regional level in the Alpine countries and interprets them in the light of major trends at European and international level. Section 3 then summarizes activities that have been undertaken as a follow-up of the Energy Platform as well as related activities of the Alpine Convention under the German Presidency.

The overview of recent developments is structured along the five elements that were used in the activity report of the Energy Platform. The interactions of these five elements are illustrated in the following figure, with energy production and efficient energy use in the Alps in the centre; knowledge, innovation and governance as supporting activities; and the embedment in the EU energy system as a framework.

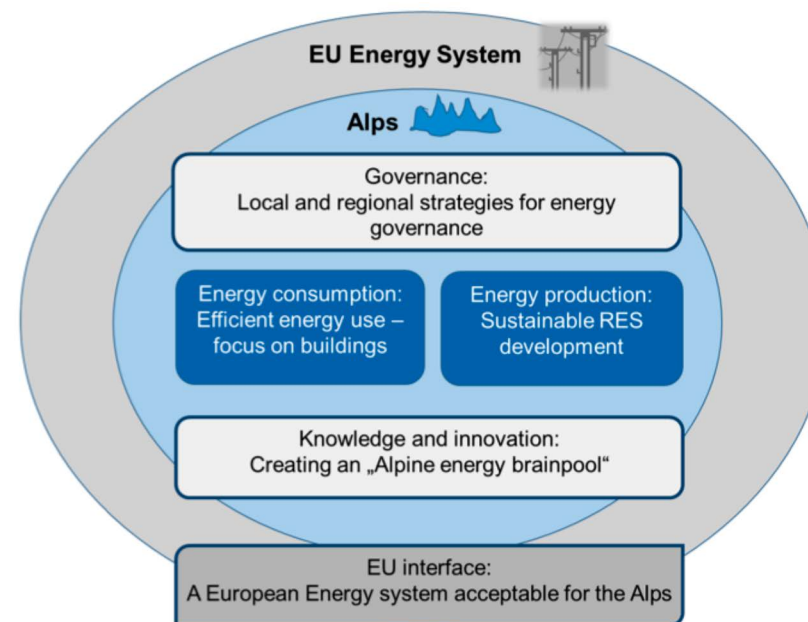


Figure 1: The five elements of the Renewable Alps vision (adapted from the Activity Report, Energy Platform, 2014).

## 2. Activities at national and regional level

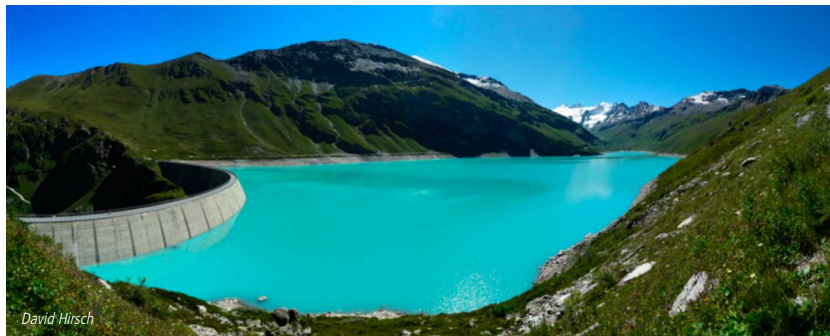
This chapter gives an overview of current developments in the Alpine countries at national as well as regional level:

- The first section provides a background on relevant strategies that frame the transition towards a renewable energy system in each country.
- The second section is based on national input provided by the delegations and shows specific activities as well as new measures and instruments that have been implemented in the last two years.
- The third section discusses these activities in the light of recent developments at EU level.

### 2.1 The policy framework of the Contracting Parties

For a better interpretation of recent developments and new regulations by the Contracting Parties, this chapter provides a short summary on the overall policy framework in each country. Reference data is also included in Annex 1. The following overview highlights major national strategies and regulations that set the scene for energy transition.

In **Switzerland**, a new Energy Strategy 2050 was decided in 2011 with the aim to completely withdraw from nuclear energy. The five remaining nuclear power stations



David Hirsch

shall be decommissioned at the end of their lifetime and shall not be replaced. Instead, renewable energy production shall be increased (hydroelectricity as well as 'new' renewable energies). In addition, energy efficiency shall be improved in buildings, the transport sector and appliances. The first action plan to implement the Energy Strategy 2050 was approved in 2012.<sup>2</sup>

In **Austria**, energy policy has been focusing on renewable energies since the 1990s. In 1999, a national law for a nuclear-free Austria (*Bundesverfassungsgesetz für ein atomfreies Österreich*) was adopted, constitutionally prohibiting nuclear power plants. The Energy Strategy 2020 sets the framework for the next years and is based on three pillars: i) energy efficiency with a stabilization of final energy consumption (target value for 2020: 1,100 PJ), ii) further development of renewable energies with a focus on hydroelectricity (including pump storage), wind power, biomass and photovoltaic (PV) power and iii) increasing security of supply through a diversification of sources.<sup>3</sup> The Energy Strategy 2020 is designed to meet the objectives for Austria according to the EU Energy Package 2020, especially the renewable energy target according to Directive 2009/28/EC (34% renewable energy share by 2020).

In the preparation of the COP21 conference, the **French** government launched an energy transition process, which has the objective to strengthen renewable energies and to reduce the dependence on nuclear energy. With the Energy Transition to Green Growth Act (*Loi relative à la transition énergétique pour la croissance verte - LTECV*), the government defined specific targets to reduce France's energy dependency and CO<sub>2</sub> emissions.<sup>4</sup> It aims at reducing greenhouse gas (GHG) emissions by 40% until 2030 (compared to 1990), reducing final energy consumption by 50% until 2050 (compared to 2012) and increasing the share of renewable energy sources to 40% of the electricity production by 2030. The share of nuclear power shall be reduced to 50% by 2025. Specific actions to reach these targets have been identified for several sectors: renovation of buildings, development of clean transport solutions, circular economy and the promotion of renewable energies. For the building and housing sector, the LTECV builds on existing legislation: With the transposition of the Energy Performance of Building Directive (EPBD) and the two *Grenelle* laws, France already has an important set of regulations aiming at decreasing the energy consumption of the building and housing sector. Those regulations deal with the energy performance of newly constructed buildings and renovated buildings. The Energy Performance Certificate (EPC) has also raised awareness of citizens for the energy performance of their dwellings.

2. Energy Strategy 2050 for Switzerland and first action plan (2012)

3. Energy Strategy Austria 2020 (2010)

4. Energy transition to Green Growth Act, France (2015)

In **Italy**, a National Energy Strategy (*Strategia Energetica Nazionale* - SEN) was approved in 2013.<sup>5</sup> It defines four main objectives for the Italian energy system: i) reduction of energy costs by aligning prices to European averages, ii) meeting and going beyond European targets as set out in the 2020 European Climate & Energy package and the National Action Plan of 2010, iii) improving supply security and iv) boosting growth and employment by mobilizing investments in the energy sector. An improvement of energy efficiency is at the core of the SEN and it is foreseen to reduce final energy consumption by 15.5 Mtoe between 2011 and 2020. The SEN also foresees further support to increase the share of renewable energies. The development of non-hydroelectricity renewable energy production has increased very sharply between 2008 and 2013 due to generous feed-in tariffs. This trend is expected to continue in the coming years, but Italy will still remain dependent on energy imports.<sup>6</sup>

**Germany** is implementing a long-term overall strategy that embraces all sectors of the economy and aims to restructure the energy supply to make it secure, economic and environmentally compatible. The main pillars of the energy transition (*Energiewende*) are boosting energy efficiency, cutting energy consumption and further expanding renewable energy in order to cover the remaining demand.<sup>7</sup> Basic targets of the *Energiewende* have been established in the Energy Concept, which was adopted in 2010. It determines that Germany will *inter alia* reduce its GHG emissions by 40% until 2020 and by 80-95% until 2050 (compared to 1990), raise the share of renewables in gross final consumption to 18% (2020) and 60% (2050) and increase final energy productivity by an annual 2.1% until 2050. An action plan, which followed the Energy Concept in June 2011 after the events in Fukushima, foresees a complete phasing-out of nuclear energy until 2022. Germany's efforts have resulted in a considerable success of renewable energy deployment, particularly in the electricity sector. In 2014, the share of renewables in gross final energy consumption reached 13.5% (27.4% of gross electricity consumption). In Bavaria, the renewables share was even higher, with 18.8% in gross final energy consumption and 36.2% in gross electricity consumption.

**Liechtenstein** adopted its National Energy Strategy 2020 in the year 2012. The strategy is based on the 20-20-20 target system and defines six areas for action. Improving energy efficiency of buildings had been an important pillar in the previous energy concept that will be continued until 2020. In addition, energy efficiency shall be improved in appliances and processes as well as the mobility sector. The Energy Strategy 2020 also foresees the

5. Italian National Energy Strategy (2013)

6. Deloitte (2015): European energy market reform: Country profile – Italy

7. Energy transition in Germany: Overall strategy and additional information, [www.bmwi.de](http://www.bmwi.de)

further development of renewable energies, an awareness raising campaign as well as the improvement of the knowledge base and energy data.<sup>8</sup>

**Slovenia** adopted its National Renewable Energy Policy in 2010 for the period 2010-2020.<sup>9</sup> The most important renewable source of energy in the country is wood biomass, followed by hydropower. In recent years, development has been most dynamic in exploiting solar energy and biogas. The potential of these energy sources, plus wind and geothermal energy, is likely to contribute to increased consumption of renewable energy sources. The objectives of Slovenia's energy policy for renewable energy sources are to ensure a 25% share of renewable energy sources in final energy consumption and a 10% share of renewables in transport by 2020. Based on current forecasts, this will involve a doubling of the energy generated from renewable sources relative to the baseline year of 2005, halting the growth of final energy consumption as well as implementing efficient energy use and renewable energy sources as economic development priorities. In the long term, the share of renewable energy sources in final energy consumption needs to be further increased. There are also two action plans for fostering activities in the field of energy efficiency: i) an action plan for energy efficiency for the period 2014-2020, and ii) an action plan for nearly zero energy buildings 2014-2020 and a Long Term Strategy for Mobilising Investments in the Energy Renovation of Buildings. In 2015, Slovenia and Croatia have agreed to extend the lifespan of the jointly owned Krsko nuclear power plant in Slovenia from 40 to 60 years, based on their evaluation of the plant's record in operational safety and economic results.

The **Principality of Monaco** has a large number of seawater heat pumps, which constitute an important energy asset. Nevertheless, there is still significant potential for limiting emissions and improving energy efficiency in existing buildings. As part of its efforts to achieve its emissions targets and communicate its post-2020 commitment, the Principality decided to define a reduction strategy for buildings throughout the country. This strategy will require performance and energy substitution measures. It should lead to the formulation of an energy master plan that will cover supply, energy carriers and local production, with the long-term goal of carbon neutrality.<sup>10</sup>

#### Synthesis:

- The Contracting Parties have developed overall policy frameworks for a comprehensive energy transition. The energy policy frameworks of the Alpine countries include a strengthening of

8. National Energy Strategy Liechtenstein (2012)

9. National Renewable Energy Action Plan 2010-2020 (NREAP), Slovenia (2010)

10. Principality of Monaco national contribution to the United Nations Framework Convention on Climate Change (2015)



renewable energies, an improvement of energy efficiency and thus also the support of climate change mitigation and adaptation policies. While some Contracting Parties initially had a lower share of renewable energies (e.g. Italy, France and Germany), others already started from an energy system with a large share of renewables (e.g. Austria and Switzerland, with a strong focus on hydroelectricity). All countries aim at further development of renewable energy sources, with the most ambitious targets of a nearly 100% renewable energy system by 2050 in Switzerland and Austria and shares of 60% in gross final energy consumption and at least 80% in gross electricity consumption by 2050 in Germany. While some Alpine countries like Austria or Liechtenstein have never operated nuclear power plants, others have stopped producing nuclear energy (Italy), decided to phase it out (Switzerland and Germany), or are reducing their dependency on nuclear energy (France).

- The national strategies are in line with the EU 2020 climate and energy package, which defines specific targets for GHG reduction, energy savings and the share of renewables in final gross consumption (see Annex 1 for an overview). Most Alpine countries have also already put in place energy strategies for 2030 or even 2050 that consider the overall target system of the 2030 EU Energy Strategy.

## 2.2 Recent initiatives as reported by the Contracting Parties

All Contracting Parties have delivered input on the implementation of the Renewable Alps vision. The following table gives an overview on the reported developments. It can be seen that the Contracting Parties have reported overall policy programmes as well as specific measures and instruments. Some information also relates to specific experiences with measures and instruments.

	Name of programme/measure/instrument	Implementing country
<b>Element 1 - Energy consumption</b>	National Action Plan on Energy Efficiency, including reinforcement of the CO <sub>2</sub> -related buildings modernisation programme; Energy Efficiency Strategy for Buildings Climate Action Programme 2020 with over 100 measures	Germany
	Tax deduction for energy-efficient refurbishments	Italy
	New regulations on sustainable buildings within the LTECV Act	France

<b>Element 2 - Energy production</b>	Review and adjustment of the Renewable Energy Sources Act	Germany
	Experiences with feed-in tariff scheme for photovoltaic power	Italy
	Feed-in tariff scheme for renewable energy sources and combined heat and power	Slovenia
<b>Cross-cutting elements 1 and 2</b>	Climate protection initiative <i>klimaaktiv</i> 4 thematic categories: building and renovation, energy savings, renewable energy and mobility	Austria
	SwissEnergy programme with focus on buildings, renewable energy, mobility, industry and services sectors and electrical appliances	Switzerland
	Energy efficiency law, including support for energy efficiency measures as well as solar thermal, heat pump and photovoltaic systems	Liechtenstein
	Mission for Energy Transition	Monaco
<b>Element 3 - Governance</b>	Climate and Energy Model Regions: support for regions that pursue the target of becoming independent from fossil fuels	Austria
	Support for local implementation of the Bavarian Energy Programme: communal energy coaches, preparation of local energy management plans and energy concepts, establishment of energy agencies, energy efficiency networks etc.	Germany
	Cities and municipalities, training and further education, and communication measures of the SwissEnergy programme	Switzerland
<b>Element 4 - EU Interface</b>	Pentalateral Forum	Germany, France, Switzerland, Austria (with Benelux countries)
	Electricity Neighbours	Germany, France, Switzerland, Austria, Italy (with 7 additional countries)
	EUSALP	France, Switzerland, Austria, Italy, Germany, Slovenia, Liechtenstein
<b>Element 5 - Knowledge transfer and innovation</b>	Green Economy Action Plan, including Masterplan Cleantech	Switzerland
	Framework programme for a transition to a Green Economy with an action programme and a plan of activities for 2015-2016	Slovenia



### 2.2.1 Elements 1 and 2: Energy production and consumption

As many recent activities relate to both energy consumption and production, these two elements are merged for this progress report.

**Austria** has set up a comprehensive climate protection initiative. *klimaaktiv* is an integral part of Austria's climate strategy and brings together all activities at the interface of climate and energy policy. *klimaaktiv*'s primary objective is to launch and promote high-quality climate-friendly technologies and services. Under the four thematic headings of Building and Renovation, Saving Energy, Renewable Energy and Mobility, *klimaaktiv* outlines new solutions, sets quality standards, increases the knowledge and expertise of the players involved and advises companies, municipalities and private households.

The Building and Renovation (*Bauen & Sanieren*) programme is being implemented in all areas of market activity. Energy-efficient building and the use of renewable energy sources thus help to reduce greenhouse gases. The central component of this strategy is the '*klimaaktiv* building standard', which is the Austrian building sustainability rating system. With respect to renewable energy systems compatible with the Alpine environment, the quality management for biomass district heating systems is another interesting element of *klimaaktiv*. It is recognised that wood is a regional energy source that needs to be used efficiently in district heating systems. Under the heating plant quality management programme, each district heating plant needs to undergo a quality control process to identify options for efficiency improvements and thus an efficient use of regional biomass.<sup>11</sup>

11. [www.klimaaktiv.at](http://www.klimaaktiv.at)

In **Germany**, the policy framework for the *Energiewende*, including both an increasing share of renewables and the improvement of energy efficiency, is evaluated in a monitoring report on a yearly basis. Following discussions on the costs of the *Energiewende*, the Renewable Energy Sources Act (*Erneuerbare-Energien-Gesetz* EEG), as a major policy instrument for the deployment of renewable energies, was reviewed in 2013/2014. The EEG 2014 aims at ensuring that Germany can continue on its path towards a renewable energy system by defining a reliable deployment corridor, committing all larger installations to market their electricity directly and testing the allocation of funding for renewables through tendering. Thus, renewable energies are more and more integrated in the regular energy market so that costs for consumers can be minimised. In addition, an overall blueprint for the electricity system was developed in 2015 with a whitepaper on electricity markets (*Weißbuch Strommarkt*), based on extensive consultations, also with neighbouring countries.<sup>12</sup>

In addition, Germany further developed its energy efficiency policy. Adopted in December 2014, the National Action Plan on Energy Efficiency (NAPE) defines Germany's efficiency strategy until 2018. Key elements include the reinforcement of the CO<sub>2</sub>-related building modernisation programme, the introduction of a competitive tendering scheme for energy efficiency projects and the creation of energy efficiency networks for companies.<sup>13</sup> Additionally, Germany adopted an Energy Efficiency Strategy for Buildings (ESG) in November 2015 to boost efficiency in a sector that accounts for up to 40% of final energy consumption. The German Federal Government set the ambitious goal of achieving a virtually climate-neutral building stock by 2050. In order to achieve this, the demand for heating and cooling energy will have to be reduced significantly through suitable efficiency measures and an increasing share of renewable energy shall cover the remaining demand. Adopted in December 2014, the Climate Action Programme 2020 contains additional measures the German government has put in place to achieve the 2020 GHG reduction target. Germany will also develop a Climate Action Plan 2050 describing further reduction steps to be taken up to the target year of 2050 in the light of the outcome of the Paris climate change conference in 2015 and will back it up with actions jointly developed with the various stakeholders.

The Bavarian Energy Programme includes a focus on energy efficiency in buildings. Innovative solutions for building renovation and heating are supported in the *10,000 houses-programme*, which provides financial aid for both renovation and new low-energy buildings. In addition, new energy-efficient heating systems are supported.<sup>14</sup>

12. *Ein Strommarkt für die Energiewende, Weißbuch Strommarkt, Germany (2015)*

13. *National Action Plan on Energy Efficiency (NAPE), Germany (2014)*

14. *Bavarian Energy Programme (2016)*



A comprehensive programme to promote renewable energies as well as energy efficiency is also being implemented in **Switzerland - SwissEnergy**. Its main focus lies on energy efficiency in buildings, renewable energy, mobility, industry and services sectors, electrical appliances, cities and municipalities, training and further education, and communication. The decision by the Federal Council to withdraw step-by-step from the use of nuclear energy means that the objectives of SwissEnergy will gain importance and the programme will therefore play a significant role in the restructuring of Switzerland's energy supply in the coming decades. The cantons are among the most important partners of SwissEnergy. All cantons have their own energy offices and often also regional energy advice centres as well as support programmes. Improving the energy efficiency of buildings is a crucial pillar of the Swiss programme. All new buildings are to reach a passive house standard with respect to heat demand and a near self-sufficiency for electricity supply. The programme provides funding for renovation measures and calls for a review and further implementation of the existing labelling systems for buildings (MINERGIE standards).<sup>15</sup>



In **Italy**, a **feed-in tariff scheme for photovoltaic electricity (PV)** was implemented between 2005 and 2013. PV systems feeding electricity into the grid were subsidised by a 20-year feed-in tariff (FIT) at a constant rate. The combination of high solar radiation and a very attractive FIT led to an unprecedented growth of the national PV market, as well as the relevant share of clean energy production: from less than 90 MW of installed capacity in 2007 to 18.5 GW in 2014 (with a peak in 2011

with 9.3 GW installed). Italy is now the number four global country in terms of cumulative installed PV capacity (year 2014) even if it will soon be overtaken by the USA. At national level, in 2014 PV already covered more than 7% of domestic power demand (the EU average is 3.5%), while in 2009 the share was just close to 0.2%.

However the scheme was revised five times in eight years, often in an unpredictable way or timescale, sometimes with retroactive effect. Nowadays, PV plant installation is encouraged only through a tax credit and indirect incentives such as net metering / net billing scheme (scambio sul posto), which was recently extended to PV plants with a nominal power of up to 500 kWp (however with a negative effect on the emerging market for storage systems).

15. *Energie Schweiz Detailkonzept 2013-2020, Switzerland (2013)*

The outcomes of Italian FIT are currently being debated from several points of view. From the environmental perspective, this is a successful story for a clean energy source penetration. With respect to the stability of the national energy system and the adequate response capability to distributed generation, there are contradictory opinions. The same goes for the current and long-term financial impact on consumers' energy bills and public balance. The contribution to the national economy has certainly been relevant, although not necessarily positive. The unpredictable variations in yearly installations have had the effect of creating a very unstable PV market (from industries to engineering and installers), thus preventing the development of reliable industrial plans.

To improve energy efficiency in buildings, a **tax deduction system for the renovation of buildings** was introduced in Italy in 2007. According to this mechanism, a share of costs incurred for energy refurbishment (65% in ten fiscal years) can be deducted from national income tax. Beneficiaries may be all taxpayers, such as individuals, professionals, companies and enterprises. Similar to the PV feed-in system, the tax deduction mechanism for renovation is hampered by an unstable legal framework. As it is related to state financial laws, the mechanism needs to be reinstated for each new financial year. This has led to several changes concerning the schedule for the tax credits, the deduction percentage as well as the eligible projects. Still, the scheme has had a strong positive impact on the building stock refurbishment sector and on fostering energy-efficient urban regeneration as well as boosting employment in the building sector. According to the latest official data, from 2007 to 2013, the total national final energy savings related to this policy were slightly above 0.85 Mtoe.<sup>16</sup>

In **France**, the LTECV is the latest legislation that deals with sustainable buildings. It focuses on speeding up the energy renovation of housing and on improving the energy performance of new buildings. It has also created 75,000 jobs. The law sets an objective of 500,000 thermal renovations each year. To achieve this goal, article 14 requires insulation work to be done in case of facade restoration or roof refurbishment. In addition, existing financial incentives such as the Energy Transition Tax Credit (a 30% tax credit for thermal renovation work) and the *éco-PTZ (prêt à taux zéro, a 0% loan to finance thermal renovation)* have been extended. In order to raise awareness of citizens for their energy consumption and improve monitoring, article 26 of the LTECV makes the installation of heating consumption individualisation systems mandatory for all buildings with collective heating systems. Energy performance of non-residential buildings is also addressed in the LTECV in article 17. This article requires non-residential building landlords or tenants to have an energy audit performed on their buildings and to carry out energy efficiency measures.

16. *"Le detrazioni fiscali del 55-65% per la riqualificazione energetica del patrimonio edilizio esistente 2013", Italian National Agency for New Technologies, Energy and Sustainable Economic Development, ENEA (2015)*

Although the thermal regulation for new buildings is already ambitious (since it is considered to be the French transposition of the Nearly Zero-Energy Buildings policy addressed in the EPBD), the LTECV goes even farther by combining environmental requirements with thermal requirements. Indeed, the next thermal regulation for new buildings will take into account CO<sub>2</sub> emissions in its requirements, considered over the life cycle of the building. Energy consumption requirements will also be toughened to the extent that all new buildings will be 'positive energy buildings'. In order to mobilise construction actors, these requirements will first be applied to buildings constructed for public authorities. Private developers can also build such ambitious buildings, with a financial 'constructability bonus'. This provides a financial incentive and contributes to absorbing the additional project costs. Finally, measures to support small hydroelectricity projects such as changes in tendering procedures are being implemented.

In **Liechtenstein**, the **energy efficiency law** was implemented in 2008 as a core policy instrument and further developed in 2015. Under this law, energy efficiency measures (e.g. building and renovation of buildings, combined heat-and-power systems) as well as solar thermal collectors, heat pumps and PV systems are subsidised.

In **Slovenia**, based on the Energy Law, a **feed-in tariff support scheme for renewable energy sources and combined heat and power technologies** was implemented in 2008, with a choice between several purchasing mechanisms. Up to 2016, around 3,920 power plants have received funding from this scheme, predominantly small hydroelectricity and PV installations. The total installed capacity was about 434 MW.



Hannes Schlosser

Both the feed-in scheme and the energy efficiency measures are financed through a special surcharge on the network fee bills of all electricity users in Slovenia.

The new Energy Law (2014) introduced changes to the support scheme that were notified to the European Commission in May 2015. The support for new electricity capacity from renewable energy sources or combined heat and power (RES/CHP) will be granted in a competitive bidding process on the basis of clear, transparent and non-discriminatory criteria. The first public call for RES/CHP projects will be announced four to six months after the positive decision from the European Commission is obtained.

Energy efficiency measures are implemented on the basis of the **National Energy**

**Efficiency Action Plan** for the period 2014-2020, which was published in 2015.<sup>17</sup> The action plan includes measures on energy efficiency in buildings, on raising the energy efficiency of public bodies as well as for the industry and transport sectors. It also includes a special section on efficiency in heating and cooling as well as on energy transformation, transmission, distribution and demand responses.

**The Principality of Monaco** established a Mission for Energy Transition in 2016. The role of this mission will be to support the development of major renewable energy production and distribution projects; to develop renewable energy sources for the benefit of the Principality; and to carry out energy efficiency improvement work. The Energy and Sustainable Development Fund of the Principality, currently dedicated to financing innovative projects in the fields of energy management and developing renewable energy, will focus on the activities of the Mission for Energy Transition.

### 2.2.2 Element 3: Governance Continuing exchange on a regional and local level

In **Austria**, the **Climate and Energy Model Regions programme**, which has been funded through the Climate and Energy Fund since 2007, is one of the most successful climate governance initiatives. With this initiative, the Climate and Energy Fund supports regions that strive to become independent of fossil fuels. This goal is fulfilled by drawing on the regions' own resources and by meeting energy demand with a smart mix of renewable energy generation, enhanced energy efficiency and smart management. The programme has gained significant momentum in Austria and now encompasses 99 Climate and Energy Model Regions with 899 participating communities. Together, these regions represent 2.5 million citizens.

An important element of this programme is the networking and training programme: at least twice per year the Austrian model region managers meet for a two-day training and networking event.<sup>18</sup>

A similar approach is being implemented in **Bavaria** within the **Bavarian Energy Programme**. This programme includes a comprehensive instrument mix to improve the local implementation of the *Energiewende*. These include financial support for communal energy coaches, the preparation of local energy management plans and energy concepts, the establishment of energy agencies and many others.<sup>19</sup>

17. National Energy Efficiency Action Plan 2014-2020 for Slovenia

18. Factsheet: "Climate and Energy Model Regions An Austrian blueprint for a successful bottom-up approach in the field of climate change and energy", Climate and Energy Fund (2016)

19. Bavarian Energy Programme (2016)

### 2.2.3 Element 4: EU interface A European Energy System acceptable for the Alps



Since increasing the share of intermittent renewable energies in the energy system is easier in more integrated markets and such markets also offer the most cost-effective way to guarantee security of supply, it is important for the Contracting Parties of the Alpine Convention to coordinate and cooperate with their neighbours when developing their energy policies.

In the Pentalateral Energy Forum, the Contracting Parties France, Switzerland, Austria and Germany have been working

together with the Netherlands, Belgium and Luxemburg on electricity issues such as market coupling, security of supply and flexibility in the electricity markets. In 2015 the forum issued the first regional generation adequacy report.

Furthermore, in 2014 Germany started a series of discussions with neighbouring countries ('electricity neighbours') dealing with questions of electricity markets and security of supply, which included *inter alia* the Contracting Parties France, Switzerland, Austria and Italy, and which resulted in a common declaration signed in June 2015. In the SEN, Italy reports 3,000 MW of foreseen increase in transmission lines capacity in its northern area, as well as market integration.

### 2.2.4 Element 5: Knowledge transfer and innovation

In 2013, the **Swiss Government adopted the Green Economy Action Plan** with the objective to conserve natural resources, make consumption more environmentally friendly and strengthen the circular economy. To strengthen innovative technologies for a Green Economy, the action plan includes the Masterplan Cleantech for energy efficiency and renewable energy sources (action 21). The Masterplan Cleantech has the objective to bring together all relevant stakeholders and to create synergies, e.g. through an improved cooperation between the private and public level or an improved knowledge transfer between science and SMEs. The master plan illustrates the potential for green innovations on a global scale (patents, exports, etc.) and defines targets as well as specific actions to strengthen the country's competitiveness.

The Federal Office for the Environment is heading the 2013 Green Economy Action Plan. Other ministries are participating in the implementation.<sup>20</sup>

The **Energy Strategy of Liechtenstein** includes several specific measures that foster the knowledge transfer between different stakeholders. Several training measures are being implemented within this strategy, targeting university students but also stakeholders in the building sector. Awareness raising measures as well as an exchange of best practices are conducted for the general public. An energy coaching programme as well as the establishment of energy agencies (*Energiefachstellen*) shall support the implementation of specific measures on all levels.<sup>21</sup>

The **Slovenian government programme 'Connected for Growth, Green-Smart-Efficient'** adopted in 2015 aims at fostering the transition to a Green Economy as a response to the development challenges of modern society. The document builds upon environmental, economic and social synergies, highlighting renewable energy sources and energy efficiency. Special attention is given to achieving a wider social consensus and the more active participation of everyone in the process of shifting to a Green Economy. A structured dialogue or partnership of all stakeholders is established in order to ensure smooth implementation of the adopted programme.

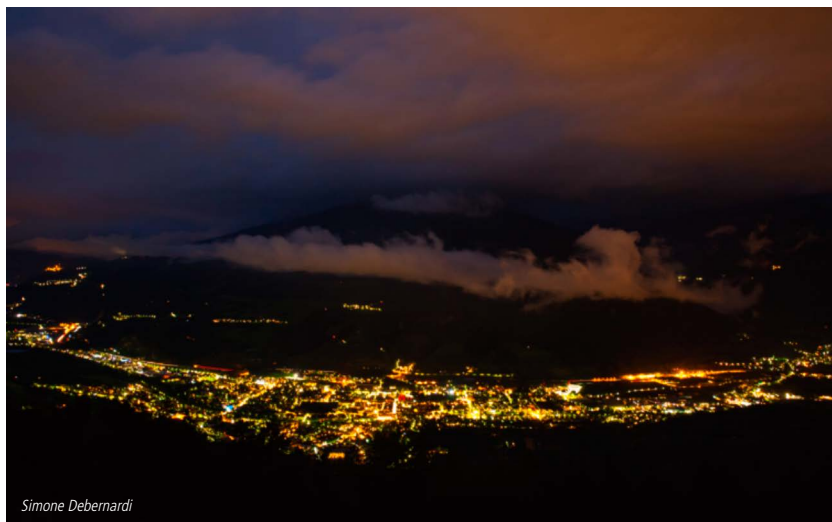
## 2.3 Reflection on recent activities in light of EU and international developments

National energy policies need to be seen in the light of the relevant framework legislation at EU level. The **EU Energy Strategy 2020** sets targets to increase the share of renewable energies as well as GHG emissions and formulates specific targets per EU member state (Renewable Energy Directive 2009/28/EC, Directive 406/2009/EC on effort sharing). In addition, the EU Member States have committed to define specific targets to improve energy efficiency and to develop national action plans with specific measures (Energy Efficiency Directive 2012/27/EU). The respective targets per member state are summarized in Annex 1.

The **climate and energy policy framework for the period 2020-2030** that the European Council agreed upon in its conclusions in October 2014 has the objective to

20. Swiss Federal Office for the Environment, [www.bafu.admin.ch](http://www.bafu.admin.ch)

21. Energy Strategy 2020 for Liechtenstein (2012)



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further develop the three main elements of the 2020 framework and to define the further target pathway. The 2030 framework establishes that until 2030, GHG emissions shall be reduced by 40% (compared to 1990), renewable energies shall reach a share of at least 27% in gross final energy consumption and energy efficiency shall be improved by at least 27%. The European Council also agreed that the 2030 efficiency target will be reviewed before 2020 to decide whether it can be raised to 30%. While the target for GHG emission reduction - with regard to the sectors not covered by the Emission Trading System - will be translated into binding targets for each EU Member State, this will not be the case for the targets for renewables and efficiency. With regard to the renewables target, it was decided that it shall initially be achieved by EU Member States contributions and complemented by EU mechanisms, which will become operational if necessary to ensure target achievement.

In February 2015, the European Commission published its **Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy**<sup>22</sup> which sets out the main pillars for developing an EU Energy Union to give consumers secure, sustainable, competitive and affordable energy. It builds on the fact that an integrated energy market is needed to create more competition, lead to greater market efficiency and produce affordable prices for consumers.

22. EU Commission, Communication, COM (2015) 80 final

The Energy Union strategy has five mutually reinforcing and closely interrelated dimensions designed to bring greater energy security, sustainability and competitiveness:

- energy security, solidarity and trust
- a fully integrated European energy market
- energy efficiency contributing to moderation of demand
- decarbonising the economy
- research, innovation and competitiveness.

The point 'fully integrated European energy market' refers to the further development and integration of the energy infrastructure. It builds on the 2014 European Energy Security Strategy, which has identified 33 infrastructure projects that are essential to improve security of supply and to better connect energy markets. While the first list of priority projects did not include any infrastructure projects in the Alpine region, the updated list of 2015 does.<sup>23</sup> Before these projects are further developed, it will be necessary to ensure a design that is sustainable for the Alpine environment.

The **first progress report on the Energy Union** (COM (2015) 572 final) illustrates first achievements in the different dimensions and also indicates whether EU Member States are on track to reach their 2020 targets. Regarding GHG reductions, it mentions that Austria will need to take additional action, while all other countries are on track. Regarding the renewables targets, all EU Member States have met their interim 2013/2014 targets and are mostly on track to reach their 2020 targets; among the Alpine Convention countries, only France will have to review its progress. Regarding energy efficiency, all EU Member States have been asked to increase their efforts. However, it is noted that some member states (including Germany, Austria and Italy) have adjusted their targets, taking on more ambitious energy efficiency targets.

To interpret recent national achievements and targets, it is also necessary to consider the results of the **COP21 in Paris**. At this conference, 195 countries adopted a universal, legally binding global climate deal, the Paris agreement. The agreement sets out a global action plan to avoid dangerous climate change by limiting global warming to well below 2°C. The agreement is due to enter into force by 2020 and includes the following key elements on climate change mitigation:

23. For further information please refer to the Union list of projects of common interest, which is part of the Energy Union Package: [https://ec.europa.eu/energy/sites/ener/files/documents/5\\_2%20PCI%20annex.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/5_2%20PCI%20annex.pdf)  
This list includes for example the following infrastructure projects: Cluster Germany - Austria - Switzerland with capacity increase in Lake Constance area (PCI No. 2.11), several storage projects in Austria and Germany (PCI No., 2.18 – 2.22) or several projects to reinforce the interconnection between Austria and Italy as well as Austria and Germany (PCI No. 3.1. – 3.4).



- Targets: restricting the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. This would significantly reduce the risks and impacts of climate change.
- Pathway: The agreement recognises the need for global emissions to peak as soon as possible, acknowledging that this will take longer for developing countries. It calls for a rapid reduction of emissions thereafter in accordance with the best available science.
- Details: The agreement also includes elements on adaptation, finance, loss and damage and international support.

Meeting these ambitious targets will require further effort and coordination at EU and national level. On 2 March 2016, the European Commission presented an assessment of the implications of the new global climate agreement for the European Union.<sup>24</sup> The assessment looks at the next steps in the process and examines how the Paris Agreement will be implemented in the EU. Especially, it is noted that the 2030 climate and energy package needs to be specified as soon as possible, setting GHG reduction targets per member state and defining an improved governance system for the post-2020 period.

In 2015, the **European Union Strategy for the Alpine Region (EUSALP)** was approved and a corresponding action plan defined, whereby action nine strives to make the Alpine region a model region for energy efficiency and renewable energy.<sup>25</sup>

Finally, national strategies and objectives are also being implemented at regional and local levels. **International networks of municipalities**, such as the Covenant of Mayors for Climate and Energy, the European Energy Award and the Climate Alliance foster local energy efficiency measures.

#### Synthesis:

Recent developments at European as well as international level re-confirm and strengthen the transition process towards a low-carbon economy and require further efforts at all stages. In particular, the transition towards a renewable energy system will have to be accelerated, and additional measures to improve energy efficiency will be necessary. While the Contracting Parties of the Alpine Convention are largely on track to meet their targets under the EU 2020 framework, further efforts will be required, especially to meet the ambitious targets of the Paris global climate change agreement.

24. EU Commission, Communication COM(2016) 110 final

25. EU Commission, EUSALP Communication (2015) 366 final, p.7

## 3. Activities in the framework of the Alpine Convention

Many individual activities towards the Renewable Alps vision are being implemented in the frame of the policies and initiatives reported above. Numerous activities have also been pursued in the frame of the Alpine Convention itself, by one or several Contracting Parties, the Permanent Secretariat or Observers. The main elements are reported in this chapter.

As agreed by the XIII<sup>th</sup> Alpine Conference, the German Presidency launched a **best practice collection of energy projects** with a focus on avoiding **conflicts concerning land use and nature protection**. The best practice collection was delegated to an external consortium. In its report the contractor identified forward-looking, economically viable projects and especially efficient technological options that provide effective solutions in conflicts with nature conservation and land use issues. Procedural aspects of the projects,



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e.g. participation of stakeholders, information exchange and planning methods were also evaluated. The focus was on successfully implemented energy projects that produce, transmit or store energy rather than on research projects. The final report was presented during the Alpweek in October 2016.<sup>26</sup>

The report shows that the significant renewable energy potential of the Alpine region can often be used in a manner that observes nature conservation and avoids land use conflicts, by mitigating the physical impact of energy projects on nature and by including the relevant stakeholders during planning, construction and operation of the project. Although some renewable technologies clearly have a greater impact on nature

26. Best-Practice-Beispiele für landnutzungs- und naturschutzverträgliche Erneuerbare-Energien-Projekte im Alpenraum, blue et al., 2016 (also available in Italian, French and Slovenian)



and a greater potential for land use conflicts than others - e.g. hydroelectricity compared to rooftop PV systems - there are sensible solutions to mitigate risks and, therefore, successfully develop further the renewable energy potential of the Alpine region.

As a follow-up to its activities within the Energy Platform's Presidency, Switzerland organised an **Energy Forum** at the Expo in Milan in June 2015. The main objective was to share ideas and results of the Energy Platform's activities with stakeholders on national, regional and local as well as EU level and to discuss how to improve further cooperation for the Renewable Alps vision. After different keynote speeches, the stakeholders discussed common principles for renewable energy systems in the Alps as well as potentials for cooperation towards 'renewable Alps'. The discussion clearly confirmed the need for further exchange of know-how and best practice examples at all levels, including local and regional. The interest for the report of the German Presidency on best practices was strong. A large number of stakeholders also expressed their interest in further energy forums on specific energy-related topics.

Switzerland and Liechtenstein also continued with the organisation of the **Constructive Alps** award. The prize winners of the third edition of this international architecture competition were announced in October 2015 and the fourth edition was launched in November 2016. Constructive Alps has the objective to develop a cross-border approach on innovative solutions for energy-efficient buildings and aims at identifying prototype models. In 2015, the 50,000 Euro award was shared between buildings in Austria, Switzerland and Italy. Eight additional buildings received a special recognition.

#### Winners of the Constructive Alps Award 2015:

- *First place: Krumbach vicarage, Austria: a major meeting place for local citizens, the new building is a good example of a modern building made from regional construction materials. The building is fully constructed in wood and was developed by local craftsmen.*
- *Second place: Türalihus and Gasthaus am Brunnen, Valendas, Switzerland: Türalihus is a historic building that was renovated to become a holiday home. The historic building structure was mainly preserved and blended with modern facilities to create a high-quality accommodation. The Gasthaus am Brunnen is a combination of a renovated historic building and a new annex building. It is an example for sustainable tourism in the Alps.*
- *Third place: Casa Riga, Comano Terme, Italy: the new building is hardly visible and seems to disappear in its environment. It is used by the local fruit farmers and includes a bed & breakfast. The building is embedded in the ground, and the surrounding soil balances the temperature inside. The building has received the KlimaHaus Gold certificate.*

The 1<sup>st</sup> **Alpine Building Conference** was organised in the framework of the German Presidency of the Alpine Convention by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the Bavarian Chamber of Architects and the Technical University of Munich. It took place in Garmisch-Partenkirchen in March 2016 and was attended by more than 200 participants from eight countries. The rich tradition and potential of the Alps in adapting to the landscape, making use of local natural resources, taking the whole life cycle of buildings into account, especially considering renovation before new building, and last but not least encouraging participative processes to shape the future of communities, were some of the main guiding principles of successful Alpine building discussed throughout the conference. The participants called for the establishment of a regular alpine-wide exchange in this field.

In April 2016, the first pan-Alpine **workshop on Climate change and energy efficiency in hotel and restaurant businesses** was organized in Oberschleißheim by the German Presidency. Participants from almost all Alpine countries were present. The aim of the workshop was to discuss experiences on how hotel and restaurant businesses can be best supported in their energy efficiency efforts. Experiences with support programmes and the implementation of specific energy efficiency measures were disseminated. In addition to the workshop, a website and a mobile app were developed to provide a platform with information on climate mitigation and energy efficiency initiatives as well as best practice projects in the Alps.



The 2<sup>nd</sup> **Alpen-Forum-Innsbruck** entitled Climate Change and Energy was organized in October 2015 in Innsbruck by the Permanent Secretariat, the alpS research institute, the French Institute, the University and the Municipality of Innsbruck. The forum was part of a continuing series of five public information evenings on climate change, with sectorial focus, organised by this partnership for the general public in 2015 and 2016. It gave an insight into the challenges and best practices in Austria and France, followed by a discussion.

Starting from 2015, the meetings of the Alpine Convention statutory bodies have systematically been organized as **green events**. The Permanent Secretariat has developed a checklist to support the Contracting Parties in endorsing this approach for their own events.

Alpine Convention Observer CIPRA International developed, with the support of the German Presidency, the **100max project**, in which more than 70 households in different parts of the Alps measured the impact of their everyday activities on their carbon footprint. The objective was to bring the topic of carbon-neutral Alps from technical questions down to aspects of individual action, behaviour and empowerment of citizens.

Finally, Green Economy was one of the priorities of the German Presidency. The sixth **Report on the State of the Alps**, to be published in early 2017, deals with this subject, including energy as one of the major aspects.

Contracting Parties of the Alpine Convention as well as the Permanent Secretariat and Observers also participated in several events and projects related to the Renewable Alps vision:

- The German Presidency supported the **conference 'Climate change mitigation now! Alpine municipalities are acting'** (*Klimaschutz jetzt! Alpengemeinden setzen um*), which was organized by CIPRA together with the Alliance in the Alps network as well as the Alpine Town of the Year association in October 2015 in preparation of the COP21 conference in Paris. The conference provided a platform for 120 decision makers from the local level to exchange their experiences with climate change policies and on the role of the local level to implement ambitious climate change targets. At this conference, a call for action for the COP21 conference in Paris was agreed upon, which was officially presented by the German Presidency of the Alpine Convention and the Secretary General of the Alpine Convention at COP21. The call for action referred to the important role of the local level for an ambitious climate change policy and included specific claims regarding the role and support of municipalities in a global climate agreement (financial support to develop relevant infrastructure, development of ambitious legal frameworks as well as coaching for municipalities, improvement of knowledge transfer and innovation, etc.). At the same time, the municipalities in the Alpine region agreed to contribute to an ambitious reduction of greenhouse gases, mainly through improving sustainable mobility, energy efficiency in buildings and sustainable consumption patterns.<sup>27</sup>

27. Call for action: Klimaschutz jetzt! (climate change mitigation now!)

- The Permanent Secretariat participated as an observer in the **recharge.green** project (2012-2015) funded under the Alpine Space Programme. The objective of the project was to offer sustainable solutions for developing renewable energy systems in the Alps, avoiding conflicts with nature protection and land use. 16 partners developed strategies and tools for decision-making on such issues. The analysis and comparison of the costs and benefits of renewable energy, ecosystem services, and potential trade-offs were key components in this process. The project, for example, produced a renewable energy atlas for the Alpine Space region and a decision support system used in the pilot areas to identify and quantify suitable areas for the installation of renewable energy systems based on sustainability and land conservation criteria. Many other tools and documents are available on the recharge.green website.<sup>28</sup>

28. [www.recharge-green.eu](http://www.recharge-green.eu)

## 4. Conclusions

Energy is an issue of particular importance in the Alps: energy demand is high both from within the region (where, due to climate and topography, the energy consumption for heating and transport is higher than the European average) and from outside (due to the role of the Alps as a major hydroelectricity and energy storage provider). However, energy production needs have to be balanced with the scarcity of land and the necessity to protect the exceptional nature and landscape. At the same time, the Alps have valuable specific assets as regards the production of renewable energy. It is therefore essential to progress towards the implementation of the Renewable Alps vision and to establish the Alps as a role model for other regions.



The overview of recent trends and activities by the Contracting Parties of the Alpine Convention shows a diverse set of policies and measures aimed at implementing the vision. Some major directions can be identified which could become the basis for further activities:

- Most countries have implemented support schemes to further develop renewable energies. The specific design mechanisms differ in each country, depending on potentials for various technologies, costs and acceptance. Several innovative elements are currently being tested in some countries (e.g. tendering mechanism in Germany) and an exchange on these elements could be used to streamline and improve the various national frameworks.

- Nearly all countries have identified the building sector as the core of their energy efficiency policies. Many support programmes have been implemented, including specific standards and rating systems (e.g. Austria and Switzerland) as well as tax deduction mechanisms (e.g. Italy and France), both for new buildings and, perhaps more importantly, for the renovation of the existing building stock. An Alpine-wide exchange was initiated at the 1<sup>st</sup> Alpine Building Conference and evidenced the rich Alpine tradition in energy-efficient building that makes smart use of the local topography and resources. This exchange of expertise on energy-efficient building and renovation that preserves the cultural character of Alpine settlements shall be further pursued.
- Recent developments as reported by the Contracting Parties mainly relate to energy production and energy consumption. In addition, energy governance is of particular importance for the Alps due to potential land use conflicts and prevalent landscape protection issues. Knowledge transfer has been initiated with this progress report and with the best practice collection on the avoidance of conflicts between land use, nature protection and energy systems commissioned by the German Presidency.
- In all the Alpine countries, there is still a potential for further development, especially in the transfer of knowledge and innovation and a more intensive dialogue with other Alpine countries. On a European level, a sustainable energy system that takes climate change into account is needed.
- The recent European framework aims at a further integration of EU energy markets (EU Energy Union). The relevant framework strategy *inter alia* aims for the further improvement of cross-border infrastructure as a crucial milestone, and various projects of major European interest have been defined. Several of them are located in the Alpine Convention perimeter and will have to be developed in compliance with the Convention and its protocols.
- Meeting the targets of the Paris Agreement will require strong efforts by all Contracting Parties of the Alpine Convention. In particular, the transformation of energy systems to widely greenhouse gas-neutral energy systems will need to be achieved. The outcomes of the Paris agreement are especially relevant for the Alps, since the Alpine area is particularly affected by climate change. The Contracting Parties of the Alpine Convention could define specific contributions by the Alpine area in order to reach the Paris goals.
- An *ad hoc* working group under the German Presidency prepared the sixth Report on the State of the Alps focussed on Green Economy which also addresses several synergies with the Renewable Alps vision. The report is expected to further support the identification of relevant fields of action for the promotion of this vision.

## Overview of the energy situation and targets of the Contracting Parties of the Alpine Convention

National targets for EU Member States							
	Share of energy from renewable sources in gross final energy consumption			Energy efficiency: Final energy consumption			Greenhouse gas reduction <sup>a</sup>
	Target 2020 <sup>b</sup>	2005 <sup>b</sup>	2015 <sup>c</sup>	Target 2020 <sup>d</sup>	2005	2014	Target 2020 (% reduction compared to 2005)
<b>Germany</b>	18%	5.8%	13.8% <sup>e</sup>	194.3 Mtoe	218.5 Mtoe	208.9 Mtoe	-14%
<b>Austria</b>	34%	23.3%	33.1%	25.1 Mtoe	27.8 Mtoe	26.8 Mtoe	-16%
<b>France</b>	23%	10.3%	14.3%	131.4 Mtoe	160.2 Mtoe	141.7 Mtoe	-14%
<b>Slovenia</b>	25%	16.0%	21.9%	5.1 Mtoe	4.9 Mtoe	4.6 Mtoe	+4%
<b>Italy</b>	17%	5.2%	17.1%	124.0 Mtoe	137.2 Mtoe	113.4 Mtoe	-13% <sup>f</sup>

National targets for non-EU Contracting Parties							
	Renewable energies development			Energy efficiency			Greenhouse gas reduction
	Target 2020	2005	2015	Target 2020	2005	2014	Target 2020
<b>Switzerland</b>	2020 target relates to 'new' RES production: 4,400 GWh in 2020 (without hydro) <sup>g</sup>	1,045 GWh (without hydro) <sup>h</sup>	2,616 GWh (without hydro) <sup>h</sup>	Energy consumption per person shall be reduced by 16% by 2020 (compared to 2000 = 154 GJ/person) <sup>i</sup>	152 GJ/person	136 GJ/person	-20% (compared to 1990) <sup>j</sup>
<b>Liechtenstein</b>	20% <sup>k</sup>	8.2% <sup>l</sup> (2008)	n.a.	Stabilisation of final energy consumption at 1,390 GWh per year (2008 level)	1,358 GWh <sup>l</sup>	1,228 GWh <sup>l</sup>	-20% (compared to 1990) <sup>k</sup>

### Sources and remarks:

a. Decision 406/2009/EC of the European Parliament and of the Council on the effort of Member States to reduce their GHG emissions to meet the Community's greenhouse reduction commitments up to 2020, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009D0406&from=EN>

b. According to Directive 2009/28/EC on the promotion of the use of energy from renewable sources  
 c. Eurostat  
 d. Absolute level of final energy consumption in 2020 [Mtoe] as notified by EU Member States in 2013, in the National Energy Efficiency Action Plans 2014 or in a separate notification to the European Commission in 2015

e. Figure for 2014  
 f. In the SEN, Italy commits further to a reduction of -21%.  
 g. According to Swiss Energy Law, Art. 2. In addition, there is a 2035 target for the further development of hydroelectricity (37,400 GWh in 2035).  
 h. Schweizerische Statistik der erneuerbaren Energien, Ausgabe 2015

i. Gesamtenergiestatistik Schweiz und Bevölkerungsdaten, own calculation  
 j. Swiss Climate Policy, Federal Office for the Environment, <http://www.bafu.admin.ch/klima/13877/14510/index.html?lang=en>  
 k. Energiestrategie Liechtenstein  
 l. Energiestatistik Liechtenstein







**CONTRACTING PARTIES:**

Austria | France | Germany | Italy | Liechtenstein  
Monaco | Slovenia | Switzerland | European Union

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