



REPUBLIC OF SAN MARINO

**First National Communication
to the United Nations Framework Convention
on Climate Change**



2009

Foreword

The First National Communication of the Republic of San Marino represents a decisive institutional step towards fulfilling the commitments undertaken by our State in 1994 when it ratified the Framework Convention on Climate Change.

While in 1994 climate change was among the main concerns in the context of global environmental changes, today it has become an absolute priority on the political agenda of all States, including the smallest ones like the Republic of San Marino. The deep changes caused by human interventions in the energy dynamics of the climate system are indeed the elements of this concern for the present and immediate future. Therefore, urgent and significant changes in our social and economic development patterns cannot be further postponed.

The national communication that I have the honour to present in my capacity as Secretary of State for Environment of the Republic of San Marino is the first assessment of greenhouse gas emissions conducted on the San Marino territory.

This represents the beginning of a process, first of all of a social and cultural nature, aimed at making all citizens of this Country aware of the need to face climate changes and effectively commit to reducing as much as possible the impact of these changes. For this reason, the priority activities undertaken by the Republic of San Marino concern education, also on account of the limited amount of its emissions. What will be most needed in the years to come in order to achieve truly sustainable development is indeed the beginning of a real "cultural revolution" so that future-capable activities and policies can be developed and implemented.

Our first national communication can therefore be considered a starting and not an ending point in order to introduce the necessary cultural and social changes as the only means to support the efforts towards change in the development pattern.

Moreover, this communication directly expresses the determination of San Marino to continue gaining in-depth knowledge on ongoing climate changes and to implement, as a consequence, the necessary measures through specific actions and programmes able to mitigate the relevant effects.

Therefore, the San Marino Government presents its first national communication to the Conference of the Parties to the Convention, with the hope that the information contained in this document will contribute to achieving the objectives both of the Framework Convention and of a renewed global environmental policy.

*The Secretary of State
for Environment and Territory
Gian Carlo Venturini*

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CHAPTER 1 Introduction

For the first time man has really understood that he is the inhabitant of the planet and perhaps he should think and act from a new perspective, not only from the individual, family, gender, State or group of States perspective but also from the planetary perspective.

Vladimir Vernadsky

The United Nations Framework Convention on Climate Change was drafted in New York on 9 May 1992 and signed in Rio de Janeiro in the same year by the world's major Governments on the occasion of the World Conference on Environment and Development. The Republic of San Marino, which took part in this memorable event together with many other small and large States, signed the Convention in 1992 and ratified it in October 1994.

At that time, the Convention represented a remarkable achievement because the threat of global warming had begun to spread only a few years before. 20 years after the publication of the international bestseller "The Limits to Growth" (Meadows, D.H. et al., 1972), which had highlighted for the first time the limits of natural resources, the international community had to realise that, among these limits, that of air was the most urgent one.

The Climate Convention has offered mankind a framework of measures to be implemented in order not to exceed such a limit. It represents the first international agreement aimed at reducing greenhouse gas emissions, emphatically underlining the principle of equity: "The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof" (Art. 3.1).

Climate change is a phenomenon not new to the Earth, which is characterised by an extraordinary dynamism showing itself not only in the climate system but also in all other natural systems. The current concern about climate change is caused by the introduction of a new element into this dynamic balance: the development of increasingly large and complex human societies, which have radically changed the quantity, quality and availability of existing natural resources over the last two centuries. The release into the atmosphere of substances uncontrollably increasing the natural greenhouse effect, the growing consumption of fossil energies, as well as deforestation, which shows no sign of being curbed, are all elements of instability adding to the complex combination of factors that determine the climate conditions of the planet.

Furthermore, the social and production systems of our species do not have any "perception" of radical climate change, since they have developed in a very short time if compared to the temporal scale of the Earth; therefore, they are used to a climate conceived as stable and will have very serious difficulties in coping with sudden and unpredicted changes.

Ensuring the continuity of our species on earth while respecting the dynamical balances of natural systems is the most important challenge for humankind and constitutes the foundation and operational basis of sustainability. The current climate changes are therefore a real and major threat to human societies and to the natural systems supporting them. Certainly, changing the role played by our species in these dynamics means to question the cultural and economic foundations of our development pattern, which has thoughtlessly based on the continuous and nearly exclusive use of fossil fuels as primary energy source.

However, States, especially small territories like the Republic of San Marino, cannot ignore that the economic development model so far implemented in Western countries, and nowadays spread worldwide, is showing its clear unsustainability in the middle and long term. In particular, it is increasingly taking us outside the biophysical limits of natural systems. Today, discussing the development sustainability does not mean making useless reflections disconnected from everyday life, on the contrary it means to effectively deal with how to use natural resources, human population growth and distribution, lifestyles and consumption patterns of societies, our interaction with natural systems, the preservation of evolutionary dynamics of biodiversity on the Earth, the role of technology, the role of science and knowledge, the role of political action and the role of "governance".

Considering all these aspects, environmental protection is not only a value but also a right, which has been proposed for inclusion among the fundamental and inalienable human rights of citizens, with the more general objective of mutually including human and environmental rights. From this point of view the notion of community shall be modified and intended not only in a territorial sense but also in a global sense, as "community of destiny". Today's problems, especially the environmental ones, are too interconnected to be adequately solved in a system based on nation-states. Therefore, our goal should be to implement a civilising policy of the Earth by developing an ecological citizenship able to establish new forms of training and education to the world's cultural and material interdependences.

The idea of being a citizen of and belonging to a democratic and horizontal community, where all members are equally involved, allows to overcome the dichotomy between local and global issues, as well as between public and private interests. In a society where common efforts in favour of sustainability are primarily needed, it is crucial to ensure democratic participation in the decision-making processes concerning environmental issues. This participation can be supported only by encouraging a social identity model, in which people consider themselves as citizens rather than consumers. A model based on citizenship entails the sharing of common spaces and mutual responsibilities according to the principles of participatory democracy. Only in a democratic and participatory context is it possible that individuals fully accept the responsibility for their use of natural resources and the consequences of their social and economic behaviours at a global level. Our small and ancient Republic strongly supports the need to express a full and responsible ecological citizenship encouraging the citizens of the "homeland of common destiny" to imagine that another world is possible, provided that they creatively imagine themselves as possible persons.



CHAPTER 2

National Circumstances of the Republic of San Marino

2.1 Geography, geology and land use

The Republic of San Marino has progressively developed over the centuries from a small settlement located on top of a rocky mountain known since ancient times as Mount Titano, the maximum height of which is 739 m AMSL. Due to the rather low height of surrounding hills, Mount Titano is well visible even from a great distance, thus appearing higher than it really is. Unlike the surrounding landscape, it is very sharp and has a peculiar aspect. This is probably the reason why it has been named "Titano" (Titan) from time immemorial.

The San Marino territory has the shape of an irregular quadrilateral (Figure 1), with a maximum South-West to North-East length of 13 km and a maximum West to East width of 8.75 km, for a total extension of 61.19 km². There are three main watercourses: Torrent Ausa and Torrent Marano, flowing to Rimini, and Torrent San Marino, which is a right tributary of river Marecchia.

The Republic of San Marino is located in the Southern end of the Romagna's Apennines facing the Adriatic Sea, between the provinces of Rimini (Northern and Eastern borders) and Pesaro-Urbino (Southern and Western borders). The height of the territory ranges between 53 and 739 m AMSL. Its South-Western half is made of a number of calcareous rock formations, the most important of which is Mount Titano, while the North-Eastern half is covered by hills smoothly degrading to the coast.

Geologically speaking, Mount Titano, like other mounts surrounding it, e.g. the Mount of San Leo, Mount Fumaiolo or Mount Verna, is made of limestone dating back to the latest phases of the raising of the Apennines (10-15 million years ago).

San Marino is the third smallest Country in Europe after Monaco and the Vatican. The air distance from the capital city (San Marino) to the Adriatic Sea is 18 km, while the distance on road, through the town of Rimini, is 23 km (Figure 2). The territory of the Republic of San Marino has no direct access to the sea. In the late 18th century, Napoleon proposed to extend its territory to the coast, but San Marino leaders cleverly declined the offer fearing negative repercussions in case the French General would have been defeated and driven away.

In spite of its limited extension, the San Marino territory is characterized by a considerable environmental variety and different microhabitats, including woods, shrubbery, glades, cultivated land, calcareous cliffs, small valleys, watercourses and urban areas. Thanks to this variety and the considerable number of ecotonal zones (i.e. transitional areas from one type of environment to the other), the San Marino territory provides the ideal conditions for the settlement of several animal species.

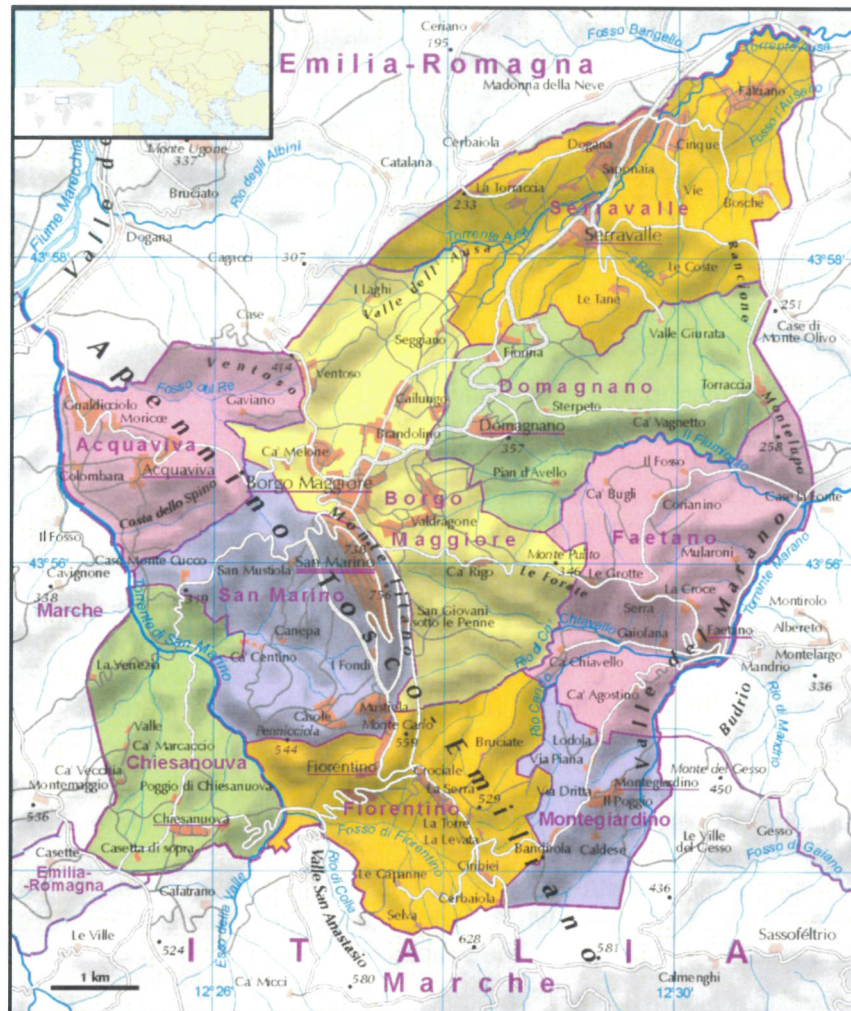


Figure 1: Map of the territory of the Republic of San Marino.

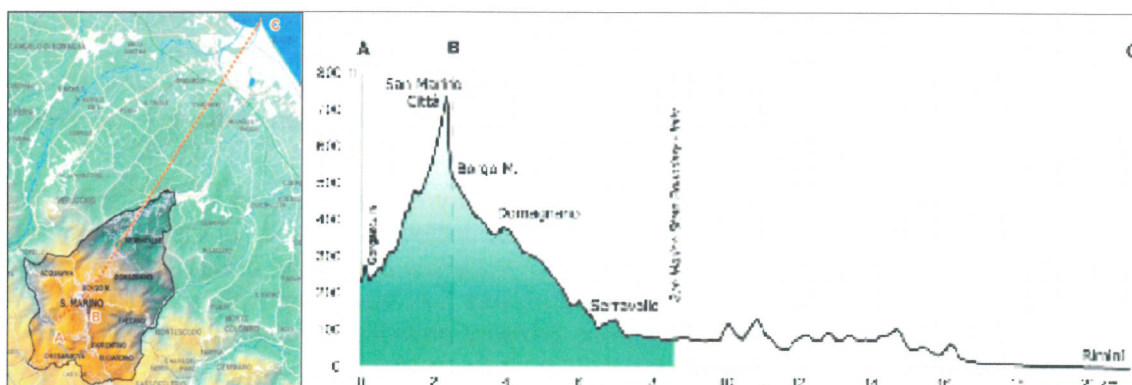


Figure 2: Topographic profile along the San Marino – Rimini axis.

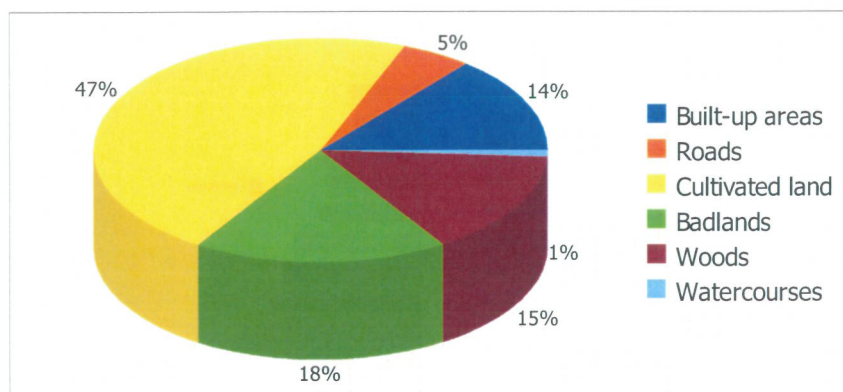


Figure 3: Land use.

In San Marino the land use is as follows: built-up areas – 14%; roads - 5%; cultivated land - 47%; badlands - 18%; woods and shrubbery – 15%; watercourses – 1% (Figure 3).

2.2 Population

In 2007 San Marino resident population was 30 792 people, composed of 15 122 males and 15 670 females (Figure 4), with an average density above 500 inhabitants per km². Since the end of the 18th century, when there were less than 3 500 inhabitants on the entire territory, the population has increased steadily. A century later this figure increased to 10 000. Life expectancy, one of the highest in the world, is 79 years for men and 85 years for women.

In 2007, the capital city, San Marino, had a population of 4 386. However, the municipality (called "Castello") with the highest number of residents was Serravalle (with 9 966 inhabitants). This is the area with the highest concentration of businesses, factories and shops. In 2007, foreigners accounted for 13.8% of the resident population, most of whom were Italian nationals.

Thanks to a legislation allowing to pass citizenship from generation to generation, there is a high number of San Marino nationals living abroad. At present, more than 12 000 San Marino nationals live in foreign countries, in particular about 8 000 in Europe and most of the remaining part in North and South America.

2.3 Climate

The Republic of San Marino extends over the Adriatic side of the Italian peninsula and is therefore located in the Adriatic-Padan subcontinental climate zone, with significant variations during the year. The San Marino territory is characterised by variable topographic heights and therefore presents significant variations from area to area.

The main subdivision is between the North-Eastern part and the more internal South-Western part of the territory. There are substantial differences between these two macro-areas in terms both of temperature and of amount and type of precipitation. For example, winter precipitations turn into snowfalls when they move from the first to the more internal

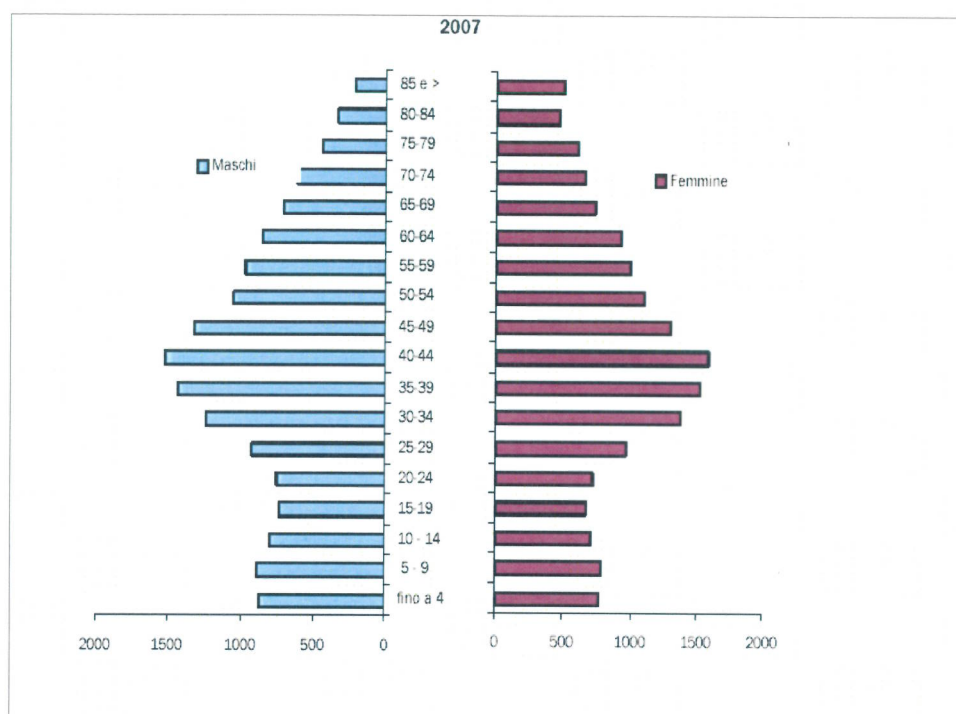


Figure 4: Residing population age pyramids (blue = males, red = females).

area. The San Marino territory is therefore characterised by different "topoclimates" and "microclimates", i.e. particular conditions in a limited area.

2.3.1 Temperatures

Considering all figures recorded until 2005 by the meteorological stations in the Republic of San Marino, the average maximum annual temperature is 14.6°C, while the average minimum annual temperature is 8.8°C (Figure 5).

Over the thirty-year period 1931-1960, the average annual maximum temperature was 14.1°C, while the average annual minimum temperature was 7.9°C. Over the thirty-year period 1961-1990, the average annual maximum temperature was 14.3°C, while the average annual minimum temperature was 8.8°C.

Over the last fifteen years, climate has shown a clear tendency towards considerable warming and an increase in temperature excursion between winter and summer. Average annual and monthly maximum and minimum temperatures have almost constantly increased, with a sharp rise starting from the 1990s.

2.3.2 Precipitations

Between 1932 and 2005 the average annual precipitation was 849.5 mm, with an average of 89.9 days with precipitation (>1 mm per day) per year.

The amount of annual rainfall shows a clear tendency towards a decrease, with a steeper slope starting from the 1980s. The average annual amount of precipitation over the thirty-



year period 1931-1960 was 914.4 mm, with an average of 89.5 days with precipitation per year. The average annual amount of precipitation over the thirty-year period 1961-1999 was 806.6 mm, with an average of 90.4 days with precipitation per year. The average annual amount of precipitation over the period 1991-2005 was 770.1 mm, with an average of 88.3 days with precipitation per year.

Similarly to the amount of annual rainfall, also the annual amount of snowfall has sharply decreased over the last fifteen years. Over the thirty-year period 1931-1960, the average amount of snow to liquid equivalent (amount of liquid precipitation that is produced after melting snow) was 99.6 mm, accounting for 12.3% of the annual precipitation. Over the period 1991-2005, the annual amount of snowfall decreased to 75.4 mm (snow to liquid equivalent), with its share in total precipitation also decreasing to 9.8%.

2.3.3 Future trends

Data collected by the meteorological stations in the Republic of San Marino clearly show that the San Marino climate has radically changed over the last 80 years. Temperatures have considerably risen in particular from the 1980s, while precipitation has constantly decreased and changed its distribution during the year.

Therefore, over the last fifteen years, the San Marino climate has followed the global trends, namely increasing average temperatures and higher frequency of extreme events. Snowfalls have become less frequent and less abundant. The number of days with below-zero temperatures have considerably decreased. The frequency of extreme meteorological events, including both intense meteorological phenomena and thermal anomalies, has considerably increased over the last years. Periods characterised by little or no precipitation and hot temperatures, and therefore heat waves and droughts, are becoming more and more frequent.

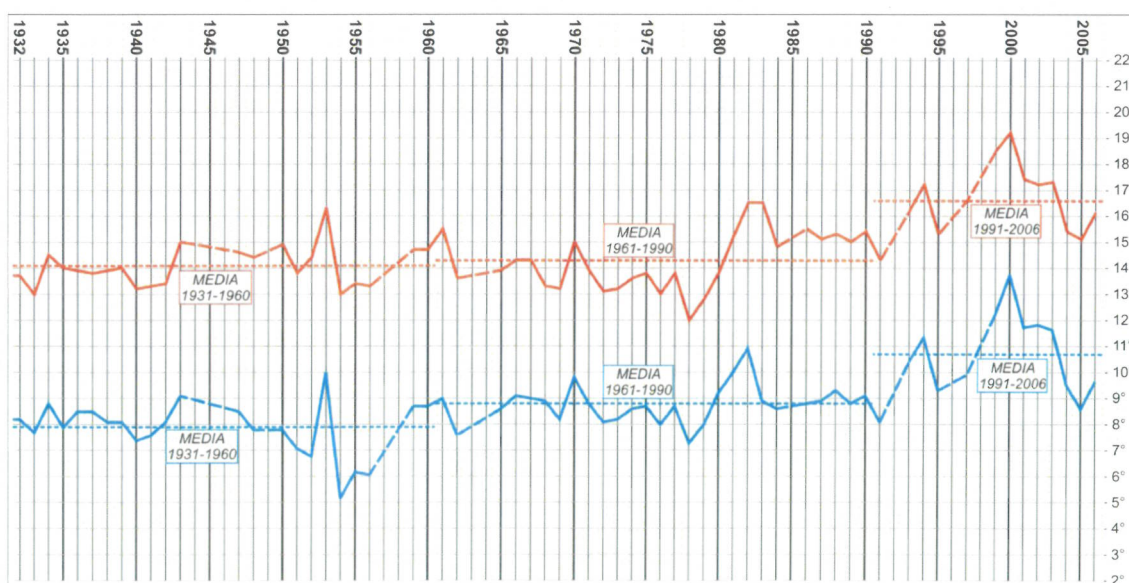


Figure 5: Annual average maximum and minimum temperatures recorded by the meteorological station of Mount Titano from 1932 to 2005.

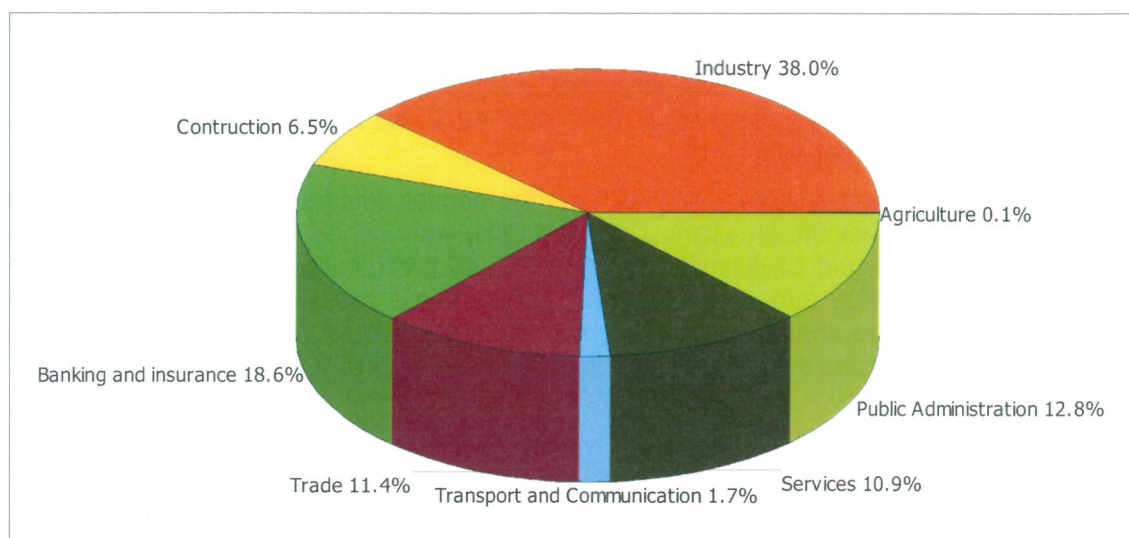


Figure 6: Breakdown of GDP by economic sector.

2.4 Economy

The Republic of San Marino, a small State surrounded by Italy, is inextricably linked to its large neighbour. The two countries are bound by a monetary and customs union; porous borders facilitate trade and mobility, with the majority of San Marino exports destined to Italy.

Generally, lower income tax rates and more favourable social contributions than in the surrounding Italian regions have promoted job creation, also attracting a high number of cross-border workers (around 5 000, almost a quarter of the total San Marino workforce), and business.

San Marino economy relies mainly on manufacturing industry, tourism and, increasingly, the financial sector. Data provided by the Office of Economic Planning show that San Marino's gross domestic product (GDP) in 2007 was equal to 1 233 million euro (Figure 6).

According to the data provided by the San Marino Chamber of Commerce (Camera di Commercio di San Marino), based on nearly the total number of enterprises active on the territory, in 2007 the total turnover of the 3 680 firms doing business in San Marino was equal to 4 945 million euro, with a breakdown by sector as per Table 1.

The service sector (mainly finance, real estate, business services, transport and communications) therefore represents more than half the economic activities carried out in San Marino, while production and manufacturing activities account for more than a third of the total turnover. The three main sectors, namely productive activities, trade and services, account for 95% of the total turnover.



Sector	N. companies	Total turnover
Agriculture	8	1 561 025
Production and manufacturing	496	1 870 492 100
Construction and building	203	207 013 728
Wholesale and retail	835	1 507 225 525
Hotels and restaurants	85	31 943 751
Other services	2 053	1 326 764 772
Total	3 680	4 945 000 901

Table 1: Breakdown by sector of the enterprises considered as a sample by the Chamber of Commerce of the Republic of San Marino and relevant turnover.

The data provided by the Office of Economic Planning (UPE - Ufficio Programmazione Economica) and related to import and export of goods and services in 2007 are as follows:

Import: 3 012 816 076.03 euro

Export: 3 630 872 304.24 euro

2.4.1 Industry

Industry is the most important sector of San Marino economy since it contributes to more than one third of GDP. Recent trends show a constant growth of manufacturing activities.

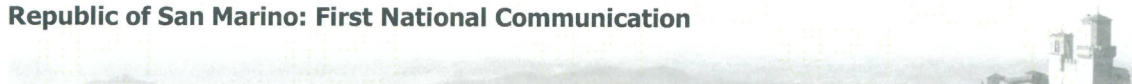
Its main branches are: metalworking, electronic and pharmaceutical sectors, processing of vegetable products, furniture, packaging, paper, clothing and ceramics. Some branches, such as mining or fishing, are not present in San Marino.

2.4.2 Transport

San Marino has no railway, harbour or airport. Therefore, commercial and civil transport is carried out by road. The road network covers 5% of the total territory and is increasing proportionally to population growth. According to data provided by the UPE, 51 590 vehicles were registered in 2007, of which 6 370 were used for working purposes.

2.4.3 Tourism

Tourism has represented a pillar of the San Marino economy over the last 40 years and it still plays a fundamental role. In 2007, 2 163 858 tourists visited San Marino (source: UPE). The majority of the tourists spends only one day in the Republic of San Marino and visits are concentrated in the summer season. The economic sectors mainly involved are shops, hotels and restaurants.



2.4.4 Agriculture

Agriculture, which is a traditional sector in the region, has gradually lost its importance in the overall economic context. However, in 2007, the total turnover of the few agricultural businesses still operating was equal to 1.6 million euro (Source: Chamber of Commerce).

Of the 2 875 hectares of agricultural land on the San Marino territory, only 2 277 are actually cultivated, which represents one third of the whole territory. The main crops are:

Cereals:	550 ha
Forage:	894 ha
Grapes:	130 ha
Olives:	159 ha

(Source: UGRAA - Ufficio Gestione Risorse Ambientali ed Agricole - Environmental and Agricultural Resources Management Office)

In San Marino, a few breeding farm are running. In 2007, 1 612 livestock were present, of which 1 250 cattle. (Source: Veterinary Service of the Public Health Department).

2.5 Energy

The Republic of San Marino has neither fossil fuel sources nor energy production plants, and therefore it completely relies on energy import. The imported amount is equal to consumption, since energy is not re-exported. Electricity and natural gas are purchased from the Italian companies ENEL and SNAM respectively.

In 2007, energy consumption in San Marino was as follows (Source: AASS – Azienda Autonoma di Stato per i Servizi - Public Utilities Autonomous State Corporation):

Electricity:	<u>251 818 730</u> kWh, of which
	52 823 127 kWh for domestic use
	198 995 603 kWh for other uses, including industry
Natural gas:	<u>38 005.71</u> t, of which
	17 350.02 t for domestic use
	20 655.69 t for other uses, including industry
Oil derivatives:	<u>45 676.69</u> t, of which
	11 865.80 t of unleaded petrol
	31 460.21 t of automotive diesel fuel
	440.33 t of diesel fuel for agricultural use
	705.03 t of diesel fuel for heating
	239.69 t of lubricating oils
	106.08 t of LPG used as fuel
	858.03 t of LPG used as automotive fuel
	1.52 t of Kerosene for heating

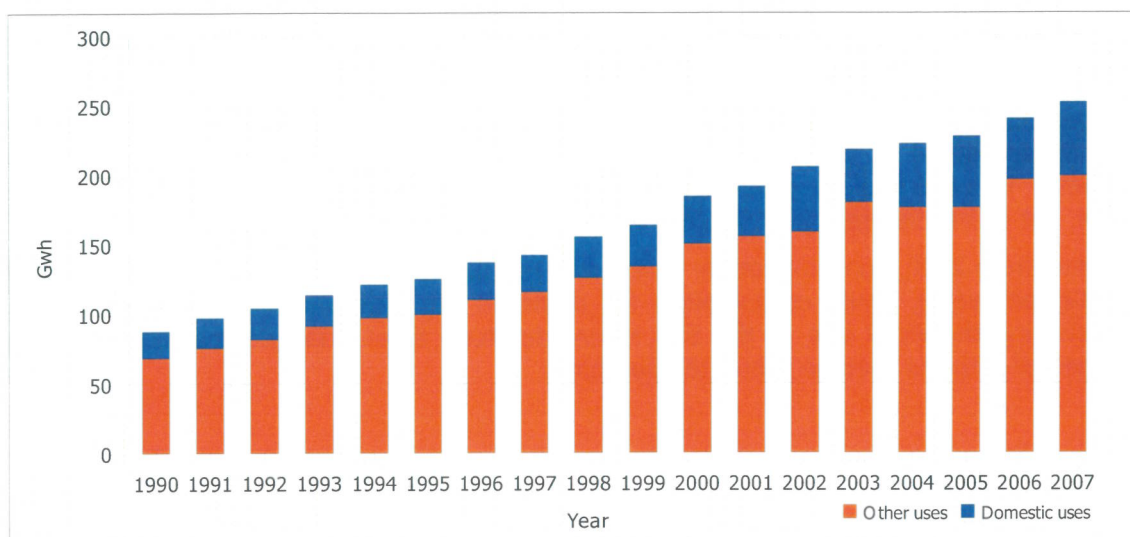


Figure 7: Electricity consumption in the Republic of San Marino from 1990 to 2007 (Source: AASS).

Over the period 1982-2007, the total demand for electricity has become almost five times higher. Increase in electricity consumption has been particularly relevant starting from the 1990s, with an average increase of almost 10 GWh per year (Figure 7).

Considering the incidence of electricity consumption per capita, San Marino is among the most energy-intensive areas in Italy, with an annual consumption in 2007 of 8 292 kWh/inhabitant compared to an average of 5 372 kWh/inhabitant recorded in Italy.

Over the period 1979-2007, the use of natural gas has increased considerably (Figure 8). In the early 1980s, the structures present in the Republic of San Marino were almost completely

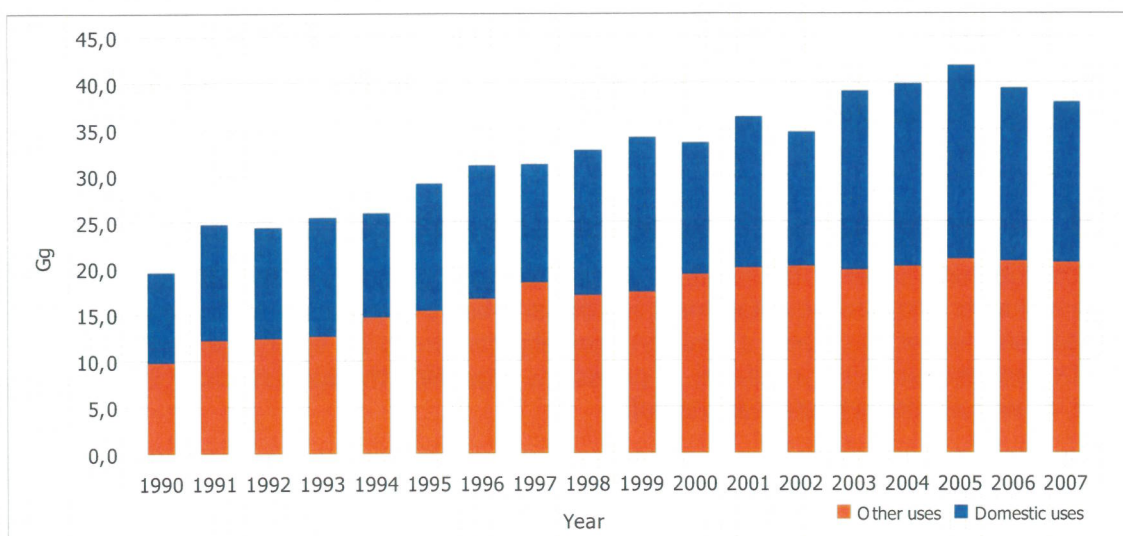


Figure 8: Natural gas consumption in the Republic of San Marino from 1990 to 2007 (Source: AASS).



converted to natural gas. Subsequently, in San Marino consumption has continued to increase at the same rate as population and economic growth.

In particular, over the period 1990-2005, gas consumption more than doubled, while it slightly decreased in 2006 and 2007. Consumption is equally divided between gas for domestic use and gas for other uses (mainly industry). However, worth noting is that in 2004, out of 14 955 users, 10.6% were industrial and 89.4% domestic users.

Starting from 2000, consumption for other uses has remained more or less the same (about 20 Gg per year), while consumption for domestic use has undergone some changes. Considering the small size of the San Marino territory, these changes are most probably connected with the average winter temperature.

2.6 Waste

San Marino has no waste disposal plants. Waste is therefore sent to disposal or recycling plants or to storage centres based in Italy. In San Marino, waste is only temporarily stored and then shipped to Italy. The conveyance and subsequent disposal of waste is regulated by bilateral agreements with Italy concerning the management of both urban solid and special waste. In 2007, the annual production of waste was 617 Kg/inhabitant. (Source: AASS)

Separate waste collection has been carried out in San Marino since 1987 and started with glass sorting. Today, it covers the main commonly used materials, most of all glass, plastics, metal, paper, wood and expired drugs. Separate waste collection is carried out through collection centres, in households and firms. In 2007, separate waste collection accounted for 18.89% of the total amount, that is 3 588 tons over a total of 18 992 tons per year. (Source: AASS)

2.7 Water

Water supply is least partly ensured by exploiting internal water resources and to a great extent by importing water from Italy. San Marino imports 12.5% of the water it consumes from the Ridracoli Dam through the Romagna Acque Consortium, 12% (already potable water supplied to end-users) from the company Hera - Holding Energia Risorse Ambiente, 12.5% from internal sources and more than 60% from the river Marecchia. In 2007, the overall water consumption was equal to 3 218 769 m³.

2.8 Government system and main institutional bodies

The constitutional order of the Republic of San Marino is based upon the Declaration on the Citizens' Rights and Fundamental Principles of San Marino Constitutional Order, which is the fundamental law of the State, a function normally performed by the Constitutional Charter. The Declaration sets forth a number of provisions regulating the fundamental powers of the State, as well as the competences thereof.



2.8.1 The Great and General Council (Consiglio Grande e Generale)

The Great and General Council is the main legislative body of the Republic of San Marino. It has developed from the ancient "Arengo" (Assembly) of the Heads of Family and is directly representative of the electorate. According to Article 3 of the Declaration on the Citizens' Rights, the Great and General Council shall exercise the legislative power, direct and control the Government policy.

The Great and General Council is unicameral. The Council's function of directing and controlling the Government policy is performed through the appointment of the Congress of State, the approval of the budget laws, the ratification of international treaties, as well as recourse to control measures over the Government's actions (i.e. questions and interpellations). The legislative power is exercised through the issuance of laws, decrees and regulations in force for the entire community.

Within the Great and General Council, the *Parliamentary Bureau*, the *Parliamentary Groups* and the *Permanent Parliamentary Commissions* perform organisational functions and are therefore not considered as bodies. The meetings of the Great and General Council are presided over by the Captains Regent, who are assisted by the Parliamentary Bureau.

The Great and General Council has the power to appoint:

- the Captains Regent
- the members of the Congress of State
- the members of the Parliamentary Commissions
- the members of the Council of the Twelve

The Great and General Council may have recourse to control measures over the Government's actions through the following:

- questions: a simple enquiry to the Government aimed at ascertaining the truth of any information or event. The member who submits the question may also request clarifications on whether or not it is the intention of the Government to transmit to the Council any acts or documents;
- interpellations: aimed at obtaining information or clarifications regarding the activity of the Public Administration.

In the framework of judiciary matters, the Great and General Council may also grant the following:

- mercy;
- pardon;
- rehabilitation after a criminal conviction.

2.8.2 The Captains Regent

Article 3 of the Declaration on the Citizens' Rights also establishes that the Office of Head of State shall be held jointly by two Captains Regent.

In their capacity as Heads of State, the Captains Regent are the supreme magistrates: they coordinate, preside over and supervise the activity of all State bodies; moreover, they represent the Great and General Council in its entirety.

The Captains Regent are elected by the Great and General Council and, according to the usual procedure, they are chosen from among its members. They must be citizens by origin, hold their office for a six-month term and cannot be re-elected before three years have passed.

The Captains Regent shall:

- call for elections (general elections, Township Councils, referenda);
- convene the Guarantors' Panel on the Constitutionality of Rules to decide on the admissibility of referenda;
- convene and preside over the Great and General Council;
- coordinate the Congress of State.

The Captains Regent are not directly responsible - neither administratively, nor politically - for the acts and provisions adopted, although they are bound to specific obligations they assume when they take office. At the end of their mandate, the Captains Regent are judged by the Regency Syndicate "for what they have and have not done".

The Captains Regent exercise the legislative power by means of the so-called Regency Decrees, which have force of law and are used especially in emergency situations. In this case, the decrees shall be subject to ratification by the Great and General Council within three months, under penalty of nullity.

Furthermore, the Captains Regent have the exclusive power to promulgate (sign) the laws, thus exercising control over the activities of the Great and General Council.

2.8.3 The Congress of State

Article 3 of the Declaration on the Citizens' Rights also states that the Congress of State is vested with the executive power, that is to say it can adopt administrative or political provisions (Decisions) considered to be necessary for the community, and is politically answerable before the Great and General Council.

The Congress of State is a collegial body and as such it shall be responsible for its decisions. The Office of Prime Minister or Head of Government is not envisaged, although the three Secretaries of State for Foreign Affairs, Internal Affairs and Finance (and among them the Secretary of State for Foreign Affairs) historically play the role of *primi inter pares*.

The Congress of State is currently divided into sectors, called Secretariats of State, which shall not exceed the number of 10. The members of the Congress of State are appointed by the Great and General Council and, with regard to their actions, they are subject to ordinary justice in case of criminal and civil procedures. They cannot remain in office for more than 10 consecutive years.

The Congress of State is also vested with the power of legislative initiative, through the promulgation of "Decreti Delegati", subject to ratification of the Great and General Council.

2.8.4 The judicial power

The jurisdictional function aims at investigating and implementing the legislation in case of disputes and litigations, and therefore at keeping social peace. The jurisdictional power is exercised only by the State vis-à-vis any person, whether natural or legal, private or public.



Magistrates, entrusted with this power, are directly responsible to the Great and General Council, by which they are appointed and possibly reconfirmed.

Jurisdictional protection is ensured through the following:

- independence of magistrates from the executive or administrative power;
- judgements pronounced within a reasonable time;
- impartiality of magistrates, who are only subject to the law;
- debate among interested parties in order to keep them on an equal footing;
- right of everyone to defend himself at any stage of the judicial proceedings;
- publicity of acts.

In the San Marino constitutional order, magistrates shall not only interpret and apply the law; indeed, their judgement shall also take account of the previous sentences applicable to the single case (case-law).

2.8.5 The Council of the Twelve

If the second instance judgement differs from that of first instance, a third instance judgement may be requested from the Council of the Twelve, which, having heard the opinion of a legal expert, shall confirm either the first instance or the appeal decision.

The Council of the Twelve shall also decide in matters concerning the jurisdictional competence of judges or suspicions about their impartiality. This body also authorises foreigners to purchase real estate, judges military violations, authorises parishes and moral institutions to sell real estate and, in some cases, it grants legal recognition to moral institutions and associations.

The Council of the Twelve is a collegial body. Its members are appointed by the Great and General Council from among its members; it is presided over by the Captains Regent, who do not have the right to vote. It is elected at the beginning of each legislature and remains in office for the whole legislature.

2.8.6 The Guarantors' Panel on the Constitutionality of Rules

The Guarantors' Panel on the Constitutionality of Rules is composed of three effective members and three substitute members. All members are appointed for a four-year term by the Great and General Council. The Panel appoints its President for a two-year term from among its effective members.

The Guarantors' Panel on the Constitutionality of Rules shall:

- verify the conformity of laws with the fundamental principles of the constitutional order;
- decide on the acceptability of referenda proposals;
- decide in case of conflicts between constitutional bodies;
- act as "Regency Syndicate".

2.9 International treaties

The Republic of San Marino has joined the following multilateral environmental treaties:

- International Convention for the Regulation of Whaling (Washington, 1946)
- IMO Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (Mexico City, London, Moscow, Washington, 1972)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES (Washington, 1973)
- United Nations Framework Convention on Climate Change (New York, 1992)
- United Nations Convention on Biological Diversity (Rio de Janeiro, 1992)
- United Nations Convention to Combat Desertification (Paris, 1994)
- European Landscape Convention of the Council of Europe (Florence, 2000)
- Vienna Convention on the Protection of the Ozone Layer (Vienna, 1985) and Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal, 1987)



CHAPTER 3

National greenhouse gas inventory

The Atmospheric Emissions Inventory of the Republic of San Marino contains the estimates of the 2007 annual emissions from human activities with reference to 6 specific substances: methane (CH₄), carbon monoxide (CO), carbon dioxide (CO₂), nitrous oxide (N₂O), non-methane volatile organic compounds (NMVOC) and nitrogen oxides (NO_x).

The Republic of San Marino is among the Non-Annex 1 Parties to the Framework Convention. Therefore, since the San Marino political bodies have not set specific targets for the reduction of greenhouse gases, they have decided to establish a first inventory of greenhouse gases by referring to 2007. This is not the reference year of the Convention, however it represents for our Republic the year for which most data necessary to compile the inventory are available.

Delays in the computerisation of San Marino public offices and other difficulties have sometimes caused problems in collecting data for the years before 2007. We have therefore preferred to draft, for the time being, the First National Communication on the basis of data now available. Of course, if San Marino starts the ratification procedure of the Kyoto Protocol, it will undertake, with all instruments available to it, to estimate greenhouse gas emissions starting from 1990, as requested by the Framework Convention.

3.1 Overall emissions

The IPCC guidelines for the following categories have been used to compile the national inventory of greenhouse gases:

- Energy: greenhouse gas emissions from fuel combustion and direct fuel emissions. These include emissions from industries, the building sector, transports, residential and commercial buildings and agricultural activities.
- Industrial processes: greenhouse gas emissions from industrial processes (emissions from fuel combustion are included in the preceding category).
- Solvents and other product use: greenhouse gas emissions from the use of products that release volatile chemical compounds (printing, dry-cleaning, chemical degreasing of metals, paints, etc.).
- Agriculture: greenhouse gas emissions from enteric fermentation, manures, agricultural soils, burning of agricultural residues (emissions from fuel combustion are included in the "Energy" category).
- Forestry and land-use change: greenhouse gas emissions and absorption from forestry and land-use change.



Chemical compound	Conversion factor	Quantity (Gg)	CO ₂ equivalent (Gg)
Carbon dioxide (CO ₂)	1	232.189	232.189
Nitrous oxide (N ₂ O)	320	0.006	1.813
Methane (CH ₄)	25	0.163	4.079
CO ₂ absorption from forestry			-4.015
Total			234.066

Table 2: Overall emissions in CO₂ equivalent of the Republic of San Marino in 2007.

With reference to energy, agriculture and land use, the data collected have allowed to compile the national emission inventory. On the contrary, data on productive activities, the use of solvents and HFCs, PFCs, SF₆ are presently not considered precise enough to be used.

Granted that in the Republic of San Marino there are neither electricity production plants nor waste disposal plants, nearly all greenhouse gas emissions are generated by burning fossil fuels for automotive purposes, as well as for domestic, industrial and service heating.

Data show that, in 2007, San Marino produced about 234 Gg of CO₂ equivalent (Table 2). Out of a residing population of 30 792 this corresponds to a per capita production of about 7.6 tons of CO₂ equivalent.

Table 3, at page 21, which indicates the total emissions of the above-mentioned substances, aggregated by macro-sectors, summarises the estimates made. This table allows to make some general considerations concerning emissions in San Marino.

Worth noting is that more than half the production of CO₂ is due to fuel consumption in the transport sector, which necessarily includes the consumption of non resident people working in San Marino or entering the territory for tourism or other reasons.

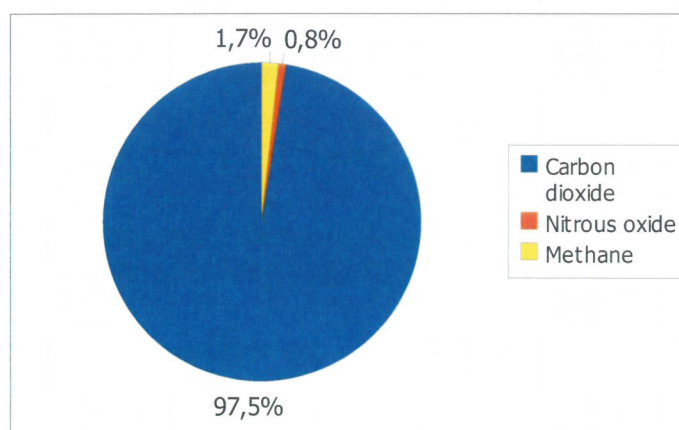


Figure 9: Greenhouse gas emission percentages in CO₂ equivalent.

Moreover, a minimum amount of greenhouse gas emissions is from the agricultural sector, with particular reference to livestock breeding on the territory.

3.2 Estimate analysis by type of substance

For each substance included in the inventory, here follows a brief note describing the main characteristics and origins, as well as some considerations on its weight, diffusion and evolution at local level on the basis of the estimates in Table 3. Among the characteristics of greenhouse gases, reference is made also to their "Global Warming Potential" (GWP), which indicates the ratio of the warming caused by a substance compared to the warming caused by a similar mass of carbon dioxide.

3.2.1 Methane (CH₄)

Methane is a greenhouse gas with GWP equal to 21. Methane emissions in the Republic of San Marino are essentially due to the degradation and fermentation of organic substances. Indeed, nearly 83% of the total methane emissions are from the agricultural sector, in particular livestock breeding. The remaining percentage essentially originates from the use of fuel in transport.

3.2.2 Carbon monoxide (CO)

Carbon monoxide emissions (GWP=2) result from imperfect combustion. The fact that 98% of the total CO emissions are from the transport sector confirms that CO is a typical traffic pollutant.

CO concentrations are constantly measured by a monitoring station located on the territory. The average concentration measured in 2007 was 0.36 mg/Nm³.

3.2.3 Carbon dioxide (CO₂)

Carbon dioxide is the main cause of global warming. CO₂ emissions in the Republic of San Marino are mainly from the use of fossil fuels in the transport sector.

3.2.4 Nitrous oxide (N₂O)

Due to the considerable influence of nitrous oxide on global greenhouse effect (GWP=320), great importance is attached to this substance in order to identify any measure to curb emissions. In the Republic of San Marino, the main sector responsible for nitrous oxide emissions is agriculture.

3.2.5 Non-methane volatile organic compounds (NMVOC)

This category conventionally includes thousands of different substances coming from various sources. They may be released unaltered by processes of use (they are volatile at room temperature), or they might have been subject to processes of partial oxidation. Some of these substances are particularly dangerous or toxic or, as in the case of benzene and aromatic polycyclic hydrocarbons (APH), it is demonstrated that they can cause cancer.



Organic compounds, together with nitrogen oxides, are precursors substances in complex photochemical cycles that ultimately produce ozone and organic peroxides, as well as nitrate and sulphate ions, which contribute to generating free radicals, strongly oxidised substances and PM10.

Available data show that the major contribution to the emission of these substances in San Marino is made by bituminous conglomerate of road surfaces, whereas a small percentage is generated by the transport sector.

3.2.6 Nitrogen oxides (NO_x)

The term nitrogen oxides refer to both nitric oxide (NO) and nitrogen dioxide (NO₂). Through photochemical cycles, nitric oxides also generate nitrates, which constitute a considerable part of fine particles.

Nitrogen oxides are generated during combustion processes because of oxidation of the nitrogen contained in the air, regardless of any fuel used. In San Marino, NO_x emissions are almost totally from combustion processes, especially in the transport sector.

CHAPTER 3: National greenhouse gas inventory

Greenhouse gas source and sink categories	CO ₂ emissions (Gg)	CO ₂ removals (Gg)	CH ₄ (Gg)	N ₂ O (Gg)	NO _x (Gg)	CO (Gg)	NMVOCs (Gg)	SO _x (Gg)
Total national emissions and removals	232.189	-4.015	0.163	0.006	1.541	5.731	1.088	0.000
1. Energy	232.189	0.000	0.028	0.002	1.541	5.731	1.082	0.000
A. Fuel combustion (sectoral approach)	232.189		0.028	0.002	1.541	5.731	1.082	0.000
1. Energy Industries	0.000		0.000	0.000	0.000	0.000	0.000	0.000
2. Manufacturing industries and construction	0.700		0.000	0.000	0.002	0.000	0.000	0.000
3. Transport	138.961		0.019	0.001	1.434	5.632	1.070	0.000
4. Other sectors	92.528		0.008	0.001	0.106	0.099	0.012	0.000
5. Other (please specify)	0.000		0.000	0.000	0.000	0.000	0.000	0.000
B. Fugitive emissions from fuels	0.000		0.000		0.000	0.000	0.000	0.000
1. Solid fuels			n/a		n/a	n/a	n/a	n/a
2. Oil and natural gas			n/a		n/a	n/a	n/a	n/a
2. Industrial processes	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000
A. Mineral products	0.000				0.000	0.000	0.006	0.000
B. Chemical industry	0.000		0.000	0.000	0.000	0.000	0.000	0.000
C. Metal production	0.000		0.000	0.000	0.000	0.000	0.000	0.000
D. Other production	0.000		0.000	0.000	0.000	0.000	0.000	0.000
E. Production of halocarbons and sulphur hexafluoride								
F. Consumption of halocarbons and sulphur hexafluoride								
G. Other (please specify)	0.000		0.000	0.000	0.000	0.000	0.000	0.000
3. Solvent and other product use	n/a			n/a			n/a	
4. Agriculture			0.135	0.004	0.000	0.000	0.000	0.000
A. Enteric fermentation			0.094					
B. Manure management			0.041	0.001			0.000	
C. Rice cultivation			0.000				0.000	
D. Agricultural soils				0.003			0.000	
E. Prescribed burning of savannahs			0.000	0.000	0.000	0.000	0.000	
F. Field burning of agricultural residues			n/a	n/a	n/a	n/a	n/a	
G. Other (please specify)			0.000	0.000	0.000	0.000	0.000	
5. Land-use change and forestry	0.000	-4.015	0.000	0.000	0.000	0.000	0.000	0.000
A. Changes in forest and other woody biomass stocks	0.000	-4.015						
B. Forest and grassland conversion	n/a	n/a	n/a	n/a	n/a	n/a		
C. Abandonment of managed lands		0.000						
D. CO ₂ emissions and removals from soil	n/a	n/a						
E. Other (please specify)	0.000	0.000	0.000	0.000	0.000	0.000		
6. Waste			0.000	0.000	0.000	0.000	0.000	0.000

Table 3: Greenhouse gas inventory of the Republic of San Marino in 2007 (n/a = data not available at the time of publication of the communication).



CHAPTER 4

Steps taken or envisaged to implement the Convention

4.1 Measures to facilitate adaptation to climate change

Climate changes, in particular the increase in global average temperatures and variations in meteorological precipitation, have considerable implications on human health.

The impacts of climate on human health are already evident in countries hit by drought and floods, in particular in the South of the world, and in countries affected by the so-called "heat waves", as occurred in some European regions in 2003.

Along with direct consequences, there are also indirect effects related to environmental changes, which can be caused by climate change. This is the case of the potential increase in and northward migration of infective diseases transmitted by vectors (malaria, leishmaniasis, West Nile fever, chikungunya, dengue fever, etc.), the increase in diseases caused by consumption of unsafe food and non-potable water, as well as a higher concentration of pathogens in the air.

In order to prevent these risks in the context of a local community such as San Marino, some of the effects of climate change on human health have been analysed, while envisaging specific adaptation measures in those areas which represent a real risk for San Marino.

4.1.1 Heat waves

The problem

Deaths related to heat waves are becoming an increasing problem in many regions, in particular during summer. An increase in frequency and intensity of heat waves will further worsen the situation.

For the EU populations, estimates indicate a 1-3% increase in mortality rate for each 1°C increase in the summer average temperature. Elderly people are more at risk since they have a reduced physiological ability to regulate their temperature (thermal regulation).

Potential risks in San Marino

At present, no increase in the number of deaths during summer months has been recorded in San Marino, contrarily to what occurred in some European countries in summer 2003. However, potential risks for health derive from the fact that, in the last few years, a progressive increase in temperatures has been recorded also in San Marino. Furthermore, because of the progressive ageing of the population, an increasing number of elderly people will be exposed to heat waves.



Measures

Through the national health information system it will be possible to identify and quantify population groups at risk and in need of preventive measures.

San Marino intends to establish a warning system monitoring the number of heat waves-related hospitalised patients by differentiating flat areas (more vulnerable to heat waves) from hilly areas. Moreover, San Marino intends to launch awareness-raising campaigns to reduce the risks related to heat waves by informing the population on the adoption of healthy lifestyles and behaviours during summer months.

Health personnel should be trained on issues related to the impact of heat waves on health.

4.1.2 Vector-borne infectious diseases

The problem

Climate change is likely to cause changes in the ecological systems, thus affecting seasonal activities of local vectors and migration of tropical vectors. This may result in the indirect spreading of infectious diseases transmitted by these vectors.

For instance, some climate change models estimate an increase in the risk of malaria also in Europe. Moreover, in the last few years, some cases of chikungunya and West Nile fever have been reported in Italy for the first time, in particular in the near Emilia-Romagna region.

Potential risks in San Marino

Although no cases of vector-borne infectious diseases have been reported so far, the proximity of San Marino to Emilia-Romagna entails a possible risk of transmission also in the Republic.

Measures

San Marino is committed to strengthening its vector monitoring system and developing measures aimed at preventing processes, which could provide a breeding ground for vectors.

4.1.3 Food infections

The problem

Several studies have confirmed and quantified the effects of high temperatures as expressed in common forms of food intoxication, e.g. salmonella.

Potential risks in San Marino

Pathologies related to food infections might spread in San Marino as well, especially during summer months.

Measures

San Marino has developed food self assessment systems (SSOP – HACCP) and inspection systems to guarantee food and beverage safety.



4.1.4 Additional measures

A health and social system shall be developed in San Marino in order to systematically face future effects of climate changes. To this end, the integration with other strategic sectors, such as territory, economy and education, will be necessary.

In particular, the following shall be implemented:

- an information system connecting health and climate aspects, as well as warning systems for pathologies related to climate changes;
- a health emergency plan allowing for a rapid response also to climate-related emergencies;
- health facilities equipped with adequate instruments for the treatment of climate-related diseases;
- training and information programs for health professionals on issues regarding climate and health.

4.2 Measures to mitigate climate change

The Republic of San Marino has already adopted some legislative instruments containing measures to mitigate climate change. In particular, Law no. 72 of 7 May 2008 "Promotion and enhancement of energy efficiency in buildings and of renewable energy use in the civil and industrial sectors" identifies specific energy requirements in the building sector in order to promote the use of renewable energy sources. Moreover, it prescribes the analysis of industrial energy consumption with a view to improving the efficiency of production processes.

Two other important legislative instruments aimed at promoting the reduction of both energy consumption and emissions are Delegated Decree no. 53 of 16 April 2007 "Tax provisions to encourage investments and business consolidation" and Delegated Decree no. 67 of 1 June 2007 "Provisions to encourage the use of low environmental impact vehicles". In particular, Article 2, paragraph 1, letter b of Delegated Decree no. 53/2007 defines encouraged investments as "the acquisition of plants, machines or technological processes aimed at achieving considerable energy savings or significant pollutant reductions".

The National Energy Plan (PEN – Piano Energetico Nazionale), developed in 2007 and used to draft Law no. 72 of 7 May 2008, is the instrument through which the Republic of San Marino identifies the main objectives, as well as development and strengthening guidelines, of the State energy system for energy production, transport, supply and saving.

On the basis of energy data and balances, the PEN provides an overview of the energy situation of the Republic of San Marino, formulates forecasts, sets goals and identifies general criteria for energy interventions based on environmental and town planning factors.

The following description of the measures envisaged to mitigate climate change is partly taken from the Technical Report on the Energy Plan of the Republic of San Marino.

4.2.1 General objectives of the National Energy Plan (PEN)

The general objectives of the PEN are:

- promotion and development on the territory of energy production from renewable sources;
- reduction of polluting emissions and of gases causing climate changes;
- rationalisation and modernisation of infrastructures, energy transport and supply networks and the relevant plants in relation to territory and environment;
- reduction of final energy consumptions in the transport, production, housing and tertiary sectors, the services supplied being equal, through energy saving and rational use, as well as information campaigns to favour implementation thereof.

In particular, the National Energy Plan (PEN – Piano Energetico Nazionale) provides for the following specific measures to reduce CO₂ emissions:

- direct measures, such as interventions for energy saving and the use of renewable energy sources (RES);
- indirect measures, such as the purchase of green energy supplies.

In order to rationally use energy sources, cut pollutant emissions, produce energy from clean sources and reduce national energy consumptions, a specific item has been included in the State Budget for planning and supporting interventions aimed at:

- a) creating an Environmental Database;
- b) establishing a pilot building site in the State structures in order to test energy saving measures;
- c) promoting information campaigns on the advantages of renewable source use;
- d) providing grants to private entities wishing to buy materials, goods and products related to renewable energy;
- e) reducing by 8% the tax rate (as provided for in Law no. 40 of 22 December 1972 and subsequent amendments), related to the purchase of materials that enable more efficient energy use;
- f) preparing a draft law to regulate the use and promotion of alternative and renewable energy sources.

4.2.2 Reduction of emissions from electricity consumption

San Marino has never had energy production units. The PEN proposes to authorise the development of generators inside the San Marino territory, thus allowing the supply of electricity from RES or co-generators.

The maximum power used is relatively limited and the installation of a co-generation plant, even of 1 MW, would be significant in percentage terms within the San Marino system.

Measures shall be adopted gradually since:

- priority shall be initially given to the installation of plants in public facilities;
- the modalities of electricity supply from private plants shall be verified;
- the technical development stages of plants shall be monitored.

Low power plants, notably up to 50 kW, will take advantage of facilitations and simplifications in terms of electricity supply since the Public Utilities State Corporation (AASS – Azienda

Autonoma di Stato per i Servizi) will rely on a quite stable electricity input. Many small-sized plants might guarantee a considerable and reliable electricity input, because it is very unlikely that they all stop at the same time.

Therefore, the installation of 5 MW electrical power from methane co-generation is envisaged by 2012 in State or private facilities provided with the necessary guarantees. These will be able to generate 25 200 000 kWh/year with a methane consumption increase by 3 090 000 Nm³/year.

At the same time, electricity tariffs shall be adjusted by differentiating supply costs according to the time bands during which electricity is used. In this way, the use of electricity outside demand peaks will be encouraged. Electricity tariffs shall be structured according to consumption bands: higher costs shall be applied to high consumption, in order to increase users' awareness of energy saving.

4.2.3 Reduction of emissions using renewable sources

The PEN attaches great importance to renewable energy sources by presenting various ideas on how to use them.

Hydroelectric energy

The orographic characteristics of San Marino do not allow to use considerable hydroelectric resources. However, there are some watercourses that might supply the amount of energy necessary to satisfy limited consumption needs through mini-hydroelectric systems.

Wind power

Following a preliminary collection and processing of anemometric data to identify areas suitable for installation, the objective, as stated in the PEN, is to install at least 10 small air-generators (20-50 kW) and to monitor their production in the next few years.

Geothermal energy

Although there exist no thermal aquifers in San Marino, its soil can be used as a "thermal accumulator" by exploiting its typical steady temperature through very low temperature geothermal plants.

The objective set in the PEN is to construct at least 10 new private buildings and 4 public structures served by geothermal heat pumps by 2012.

Solar thermal energy

The amount of solar thermal energy is not considerable in San Marino. The Energy Plan of the Republic of San Marino therefore intends to promote this technology, which allows to considerably save on heating costs.

The objective of the Plan is to provide every new building with a solar thermal plant satisfying up to 30% of the natural gas demand. This will allow to save 5 152 MWh/year, that is, in terms of consumption of tonne per oil equivalent, equal to 443 TOE/year.

Photovoltaic energy

Photovoltaic plants will be installed thanks to a number of incentives. Moreover, private citizens and legal persons will have the possibility to establish Energy Cooperatives to build middle and large-sized photovoltaic plants. These cooperatives will allow to cut the costs of



plant components, limit the impact of plants on the environment and facilitate their installation also in case of lack of suitable sites.

The objective set in the PEN is to install, over the next few years, 5 MWp photovoltaic plants.

4.2.4 Waste

Waste disposal is very expensive for San Marino. An incinerator has a considerable impact on the environment and therefore it would be hardly accepted by San Marino citizens. Furthermore, it should be considered that the combustion process recovers only a fraction of the energy that has gone into the production of the materials consumed.

In San Marino separate collection is not much developed and waste disposal includes all types of materials. The objective to be achieved by 2012 is to reach a 50% level of separate waste collection and to carry out a technical-economic study for the installation of a waste anaerobic digestion plant and the relevant energy generating system.

Controlled anaerobic digestion, within biochemical facilities called digesters, allows to obtain methane to be used in an endothermic engine for the production of heat and electricity. Inert sludge obtained from digesters is rich in inorganic substances to be used in agriculture; following the necessary checks and its normalisation, sludge may be spread on soil, thus contributing to the recovery of the substances lost during cultivation. The organic matter cycle would allow to dispose about half the waste within the territory, since waste would be used as energy and economic source.

4.2.5 Direct interventions to save energy in the industrial sector

The industrial sector is responsible for 72% of electricity consumption and 50% of natural gas consumption. About 50 users are responsible for 80% of industrial electricity consumption. In order to estimate energy saving targets in this sector, an "energy questionnaire" was submitted to the 30 most energy-intensive industries in the Republic of San Marino.

The analysis of energy consumption among these users will provide important information on the measures to be taken. The energy audit of the San Marino large businesses is therefore necessary to plan the most important energy saving interventions within these structures.

The targets set forth in the National Energy Plan are 20% saving in natural gas consumption for heat requirements, equal to 5 344 TOE, and 25% saving in electricity consumption, equal to 9 537 TOE.

4.2.6 Direct interventions to save energy in the civil building and tertiary sectors

In the Republic of San Marino, the civil building and tertiary sectors account for 18% of electricity consumption and 43% of natural gas consumption.

Currently, the annual average consumption of a standard house in San Marino is equal to 240 kWh/m². Some measures are being studied according to which buildings shall meet minimum requirements limiting consumption to a maximum of 50 kWh/m² per year. Interventions on existing buildings will be more complicated and will have to be offset according to possible restructuring works and their extent.



Energy savings in buildings can be achieved by reducing electric and thermal energy consumptions by improving the efficiency of systems and insulation of structures, as well as by using highly efficient electrical appliances and promoting information campaigns to raise environmental awareness among citizens in terms of energy consumption.

Thermal insulation

Interventions on the building envelope (roof, external wall and basement insulation, double glazing and thermal break frames, mechanical ventilation systems with heat recovery) lead to a reasonably estimated reduction of consumption by about 70%. By 2012, the reduction foreseen for the entire State is equal to 3 193 TOE.

Heating systems of residential buildings

For the new buildings it will be possible to plan a system of incentives rewarding the correct installation and sizing of high performance boilers.

Existing heating systems (individual and centralised) shall be replaced with highly-efficient appliances and, in the event of renovations, ordinary radiators shall be replaced with radiant panels, which allow to achieve considerable savings, since they operate at low temperature.

In this way, the San Marino system will save 620 TOE by 2012.

Electrical appliances

This intervention aims at encouraging the purchase of household electrical appliances belonging to the highest energy classes (A+ and A++), such as washing machines, refrigerators and lamps, and shall provide for the reduction of consumption in stand-by mode for these appliances.

This measure may generate savings up to 40% for each household. According to prudent estimates, a saving equal to 1.5%, that is 185 TOE, can be achieved by 2012.

4.2.7 Direct interventions to save energy in the Public Administration

Interventions concerning the Public Administration play a significant role in terms of communication and for the amount of energy effectively saved. Moreover, they may provide intervention guidelines for already existing buildings.

Many public buildings are indeed situated within historical centres and are therefore quite ancient, while those located outside the centres date back mainly to the 60s and 70s and most of them are equipped with fuel oil heating systems.

Replacement of the Public Administration's fuel oil heating systems with natural gas heating systems – public cogeneration plants

This intervention is extremely important since 59 fuel oil heating systems are still present in the major public facilities, such as schools, swimming pools, office centres, etc. These systems represent a very high cost for the community and produce climate-changing greenhouse gas emissions, which could easily be prevented.

Only by converting fuel oil heating systems into natural gas heating systems, 7 TOE will be saved annually thanks to more efficient new appliances. The replacement of old systems accompanied by energy saving measures will lead to more advantages, both economically and in terms of reduction of CO₂ emissions.



Energy efficiency measures in the Public Administration's buildings and structures

The PEN provides for interventions aimed at improving the efficiency of lighting and heating systems and encourages on-going energy consumption controls on public structures to prevent energy from being wasted due to the poor management of plants.

All public structures that are newly built or undergoing renovations shall comply with energy saving rules and install plants for the production of energy from renewable sources.

Considerable savings, no less than 25%, can be reasonably foreseen for the oldest buildings, where excellent results can be achieved with simple methods, that is to say a saving of 860 TOE per year.

The installation of light regulators and highly efficient lighting devices will allow to reduce the Public Administration's electricity consumption by 20%, that is to say 1 339 TOE.

Public lighting

Nearly all lighting devices used are constituted by sodium-vapour lamps and therefore they are already very efficient. The introduction of light flow regulators would be a further step forward, since this would guarantee a minimum energy savings of 30%, namely 363 TOE/year.

Moreover, experimental interventions, such as the use of LED lighting systems, which guarantee a minimum savings of 60% compared to the current sodium-vapour lamps, should be carried out, together with the installation of photovoltaic street lamps in areas not served by the electric grid.

4.2.8 Interventions in the Public Administration's transport sector

Public vehicles include buses for public transport, medical service vehicles, operational vehicles and cars.

The PEN suggests that each time the fleet of vehicles is renewed, routes and use profile should be considered in order to buy low environmental impact vehicles.

For example, the postal service represents an important sector of public transport, especially for its visibility and widespread presence on the territory. Consumption in this sector is reasonably stable (27 530 litres of petrol per year). The purchase of electric vehicles for the postal service will be an optimal choice, taking into consideration the daily use profile of these vehicles, namely:

- maximum 30-40 km/day;
- many engine starts and turns off;
- no need of roomy boots;
- only one person on board.

Replacing petrol cars with electric cars will allow savings of about 7 TOE/year.

4.2.9 Interventions in the private transport sector

In order to reduce emissions from private transport, the PEN provides for the following:

- to encourage extended use of natural gas or LPG vehicles;

- to encourage the scrapping of old vehicles to buy low-emission cars. These measures are partly already being implemented;
- to deter the purchase of high-emission vehicles through additional taxes;
- to grant tax reductions for vehicles purchased by self-employed workers to be used for business purposes (therefore subject to a 7% single-stage tax) only in case of low-emission vehicles.

The PEN also envisages a mobility analysis taking into consideration users' flows in order to optimise traffic flows in the Republic of San Marino.

4.2.10 Indirect interventions to reduce emissions

The PEN suggests some indirect interventions aimed at comprehensively reducing emissions, such as:

- signing of energy supply contracts with companies selling green energy: even if San Marino manages to reduce consumption and to produce energy from renewable sources, it will never be fully independent from energy imports;
- establishment of cooperatives for the recovery of waste vegetable oil or biomass to produce energy: collection of waste vegetable oil to be converted into biodiesel and used in the Republic of San Marino;
- promotion of forestation projects: a woodland of 1 hectare absorbs 300 000 kg of CO₂ per year. Forestation projects inside or outside the territory should be financed, including projects to recover degraded areas.

4.2.11 Awareness campaigns to reduce energy consumption

Anyone can contribute, with their lifestyle, to increasing or reducing consumption and therefore greenhouse gas emissions. By means of an adequate awareness raising campaign and by monitoring individual emissions, citizens will make a more efficient use of energy and gain a deeper environmental knowledge.

CO2Share

The National Energy Plan proposes CO2Share, an instrument aimed at environmentally educating families and individuals through a computer database quantifying the amount of individual climate-changing gas emissions.

CO2Share is a service offered to citizens who, by electronically filling in a form on an Internet portal, will be able to estimate their personal greenhouse gas emissions and reduce them through appropriate energy measures offered by the service providers.

Therefore, the aim is to create an instrument to help people become aware of their environmental impact and to provide them, at the same time, with the opportunity to curb climate-changing gas emissions.

CO2Share will also provide a managing instrument for the administration and monitoring of individual users' consumptions and it will be an important means to control the energy performance of buildings.



Through a numerical index calculated on the basis of the data entered into the Internet portal, a general classification of all participants in the project will be made, thus highlighting the environmental impact of every citizen through direct comparison with the other users.

CO2Share participants will be provided with targeted advice and measures, which will contribute to improving the evaluation index and, therefore, to making progress in the general classification.

Various measures are envisaged: from simple methods to avoid waste and obtain significant energy savings to more complex and expensive measures, such as installation of renewable energy systems, access to energy cooperatives, etc.

Energy Desk

The National Energy Plan envisages an Energy Desk open to the public and providing information on the following issues:

- rules and information about safety and energy savings in domestic uses;
- eco-friendly appliances and technologies available on the market;
- how to access funds, contributions and financing aimed at achieving energy savings and protecting the environment;
- laws and regulations.

The Desk shall also: deal with the development and management of the CO2Share project, carry out ongoing monitoring of San Marino energy consumption and energy efficiency by ensuring the creation of a database to adequately support the drafting of future Energy plans, and coordinate energy cooperatives by managing the contracts of all shareholders wishing to contribute to the building of renewable energy plants.



CHAPTER 5

Other information useful to achieve the objectives of the Convention

5.1 Education, training and awareness raising

In an increasingly global and interdependent world, where any individual action is the cause and result of other events, lifelong training for all is fundamental and should be focused in particular on developing skills to identify global issues and the relations existing among natural, social, political and other elements, as well as to integrate into this new material and relational context the partial and local indications originating from our experience. Education cannot but promote among citizens a responsible attitude towards the major issue of this global age, namely the creation of a sustainable society in economic, social and environmental terms as the expression of a renewed alliance between man and nature. This approach shall enhance the social dimension of individual freedom and fully develop identities and cultures, so that they become an instrument of understanding, the principle underlying relations, the expression of an open society, the progressive development of the idea of citizenship that acquires a global meaning.

However, a truly comprehensive approach is maybe still lacking. A network integrating economic, environmental and educational policies is particularly necessary because sustainability cannot be limited to only one sector. For this reason, there is a need for comprehensive training and educational programs involving not only educational institutions, such as schools and universities, but also businesses, companies and public administrations. Everybody looks forward to a better life quality, but then concrete steps to achieve such an improvement are difficult to be implemented. Information campaigns and training policies should be developed to break the stereotype that economy and ecology are two opposite concepts.

Sustainability is closely linked to preserving and developing participatory democracy. Therefore, all social and economic categories, as well as every single citizen, should be involved by organizing meetings and events, where they can exchange views, projects and make common decisions. Today, the number of governance tools has increased (local Agenda 21, territorial agreements, participatory town-planning, health plans, participatory budgets), thus highlighting the need to extend local decision-making and participatory contexts. However, their potentiality is not always fully exploited because schools still do not promote a culture of sharing and cooperation. These new contexts also require new professional roles with specific skills to facilitate relations. The planning of new educational curricula involving both in-school and out-of-school population, should be included in these new contexts created by civil society's needs.

5.1.1 Education and training

The Secretary of State for Education is responsible for coordinating education in the schools of the Republic of San Marino.

In the San Marino school system, education on climate change is part of the more comprehensive subject "Environmental and Sustainable Development Education", which includes a wide range of activities aimed at promoting among the young the knowledge of the natural environment, raising their awareness of major environmental issues and encouraging them to behave in such a way as to avoid waste of natural resources. In San Marino schools, environmental education involves the understanding of relations with or within the ecosystem, the making-up of active citizenship through participation in social processes, as well as the perspective of sustainability.

The purpose of Environmental and Sustainable Development Education is to substantially change individual and collective behaviours and attitudes. Concepts and knowledge are not fixed in themselves and therefore specific methods and instruments are chosen to promote voluntary processes of change through action.

All disciplines contribute to Environmental and Sustainable Development Education since this subject involves the entire curriculum. Many issues can be easily connected with the Republic's territory and this is the reason why they have been included in the "Curriculum guidelines for a new form of knowledge in San Marino schools", adopted with Decree no. 57 of 15 March 2006. These Guidelines are a fundamental reference tool for the "local curriculum" and include a series of interdisciplinary programs closely linked to the territory and adopted by all school grades, from nursery to high school.

Today, environmental knowledge is a new scientific paradigm, which fully recognises concepts such as "complexity", "system" and "uncertainty" as an intrinsic feature of technical and scientific knowledge. The educational programs provided for in the Guidelines are based on research and action and use the local territory, from a geographical and scientific point of view and therefore not strictly bound to political borders, as a real laboratory for the testing of various methods, with a view to best making a necessary epistemological and ethic reflection. Therefore, schools are the elected place to promote environmental, social and cultural sustainability as experience of democracy and intercultural exchange, as well as a critic analysis of the various environmental problems, that is to say a laboratory for the shaping of different territorial development models.

5.1.2 School activities

Although the topics may vary from year to year, all activities are based on two common elements:

- to live the environment in order to be able to appreciate it;
- to recognise the impact of everyday behaviour on the environment.

If the behaviour of the young is to be affected, they must get a first-hand feeling of the problem. This is why environmental issues are often dealt with through direct experience.

In kindergartens (3-6 years) the curriculum is mainly focused on experience and game, as well as on space and time dimensions as key parameters to understand the interdependence of environmental components. The acquisition of environmental knowledge through territory exploration and landscape analysis aims at stimulating children's desire to be actively



involved in the protection of the environment. Environmental education on climate change is provided in particular through specific teaching projects stressing the importance of preventing waste of resources, as well as reusing and recycling materials.

In elementary schools (6-11 years) children learn how to protect ecosystems and recognise the effects of human activities on the environment. They also learn the fundamental concepts of "Agenda 21" and are stimulated to identify possible initiatives for a "Local Agenda 21" promoting sustainable development throughout the territory. Besides specific teaching programs, also regular classes contribute to increasing children's knowledge about climate change and related issues.

In junior high schools (11-14 years) children become acquainted with specific terms and cause-effect relations. The main purpose is to develop their decision-making skills concerning environmental protection under complex and uncertain conditions and, in particular, to help them identify and analyse the interdependence among development, environment and economy on the San Marino territory. With regard to climate changes, students learn, from a scientific and geographic point of view, to assess the global impact of technologies and products on the environment and to reduce the negative effects thereof. They also learn to recognise global and local effects of the planet's warming and the importance of adopting a fairer and therefore more sustainable development model. With regard to civic and citizenship education, students are invited to take an active part in real situations, including responsibility-taking, conflict management and dispute-solving, while assessing actions and possible related consequences for the environment and future generations.

In high schools (14-19 years) students are invited to adopt a complex and comprehensive point of view in the analysis of the San Marino landscape in order to develop their skills to correlate local and global aspects. Teaching programs promote their capability to analyse and assess interdependence among development, environment and economy throughout the territory, as well as among culture, environment and technology. Students are then invited to develop intervention projects to protect the environment, including under extremely uncertain and complex conditions. High school students often take part in specific conferences on climate change and energy.

Some of the materials produced for students are available on-line at the address http://www.educazione.sm/scuola/servizi/CD_virtuali/ed_ambientale.htm.

5.1.3 Awareness raising

In the Republic of San Marino several institutional and non-governmental bodies promote information and public awareness campaigns.

The **Secretariats of State for Environment and for Industry** promote annual campaigns to encourage separate waste collection and the reduction of drinking water and electricity consumption. Local press and television play a crucial role in these campaigns.

The **"Dipartimento di Sanità Pubblica"** (Department of Public Health, <http://www.iss.sm/on-line/Home/AreaSanitaPubblica.html>) is in charge of the monitoring of environmental data inside the San Marino territory and of their publication. Moreover, it carries out education and information campaigns addressed to schools and to the population.

The **"Centro Naturalistico Sammarinese"** (San Marino Nature Centre, <http://www.centronaturalistico.sm>) includes a museum and a study centre. It was established in 1997 with a view to collecting, studying and publicly exhibiting naturalistic

materials and findings related to the San Marino environment. Ever since its establishment, it has always conducted awareness-raising campaigns through:

- a series of conferences on San Marino natural environment;
- teachers' training;
- teaching activities destined to students.

Among the Naturalistic Centre's research activities are the monitoring and analysis of the presence of exotic species facilitated by the current climate change in the ecosystems of the San Marino territory.

The "**Associazione Micologica Sammarinese**" (San Marino Mycological Association, <http://www.micologica.org/>) was established in 1990 as a non-governmental organization. The association is active in promoting respect for the environment and public health protection. The association's monthly magazine "Il sottobosco", often dealing with local and global environmental issues, is very popular.

The "**Coordinamento Agenda 21 San Marino**" San Marino Agenda 21 Coordination, <http://www.associazioni.sm/agenda21.html>) was established in 2007 and includes 23 bodies and associations. It has organised, and still organises, several training and awareness-raising initiatives for general public and schools, including conferences and exhibitions focused on the promotion of sustainable development, an in-depth knowledge of climate changes, the spreading of new technologies for alternative energies and energy saving. Moreover, it has launched awareness-raising campaigns for the reduction of energy consumption and CO₂ emissions and for the promotion of San Marino's accession to the Kyoto Protocol.



The First National Communication of the Republic of San Marino to the United Nations Framework Convention on Climate Change has been drafted within the working group for the evaluation of the Vienna Convention and Montreal Protocol and of the Kyoto Protocol, established in 2007 by the Congress of State and composed of representatives of various sectors of the public administration.

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