CEE bankwatch network

Over the edge

Enel's plans to export its pollution to Porto Romano, Albania

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Abbreviations

EIA	Environmental Impact Assessment
ETS	The European Emissions Trading Scheme
EUA	European Union Allowance (part of the European Emissions Trading Scheme)
GHGs	Greenhouse gases
HPP	Hydropower plant
LHPP	Large hydropower plant
MW	Megawatt
NAP	National Allocation Plan (part of the European Emissions Trading Scheme)
NES	National Energy Strategy
SHPP	Small hydropower plant
TPP	Thermal power plant

Executive summary

The Italian energy giant Enel is planning to construct a coal-fired thermal power plant consisting of two 800 MW units at Porto Romano near the city of Durres in Albania. If constructed this would be the largest investment in the history of the Albanian energy industry. Eighty-five percent of the electricity produced would be exported to Italy.

The advantages of the project for Enel are clear: building a new power plant in Albania instead of in Italy means that the company does not have to buy emissions allowances, thus saving between EUR 232.5 and 325.5 million yearly in 2020 (depending on the carbon emission price).

Yet it is much less clear what the benefits will be for Albania.

The Albanian government, seduced by unproven promises of cost-price electricity from the plant, is in danger of approving the project without having properly assessed its overall costs and benefits as well as the threats to local people and the environment. The project has appeared from nowhere, receiving no mention in the Albanian National Energy Strategy, and contradicts the strategy's conclusion that coal will not play any significant role in Albania's energy sector because the country has no significant reserves.

This study aims to provide a counterbalance to the overly optimistic and incomplete claims made for the project by Enel and the Albanian government by drawing attention to its environmental, social and economic impacts, including an assessment of these in the wider context of European and international trends in energy and climate policy. Where no information is available, the study identifies the gaps that need to be filled.

The overall goal of the study is to help reinforce the efforts of Albanian environmental groups to achieve a more accountable, inclusive and transparent decision-making process.

An environmental impact assessment study has been published for the project, but raises more questions than answers. It assesses no technological or fuel alternatives to the coal power plant, says little about the impacts on the local community, says nothing about what will happen to the generated ashes, and fails to examine the project's serious climate impact. If the plant is built, the CO_2 emissions of the whole country will increase more than 2.5 times from current levels. As a result of this tougher emissions reductions may be imposed on all sectors of the Albanian economy when the country joins the EU.

Neither has any serious study been done on the cumulative environmental impacts of several planned projects in the area, including a terminal for the storage of petroleum products and gas and a refinery.

Almost no information is available about the economic feasibility of the coal-fired thermo-power plant or the cost of the electricity that it would produce – nor whether such a huge plant would hamper the development of industries with better job-boosting potential such as renewable energy, energy efficiency services or the tourist industry.

An analysis of Albania's existing power plants, plans for new hydropower plants and wind power plants shows that from the point of view of security of electricity supply there is no need for such a large-scale thermal power plant as is being planned for Porto Romano. Thus, the main argument for the project – security of electricity supply – is unfounded.

The study therefore concludes that the Albanian government needs to take a more proactive role in adjudicating between different needs and interests and ensuring that measures to incentivise energy efficiency and sustainable renewable energy investments are implemented, rather than simply leaving the country's energy sector development to whichever investors present proposals.

A view out to sea from Porto Romano

1. Introduction

1.1. History of the project

During a visit of the then Italian Premier Romano Prodi to Tirana in December 2007, the partly state-owned Italian company Enel signed a memorandum of understanding with Albania under which Enel would build a thermal generation plant fuelled by imported coal with an estimated capacity of some 1300 MW[1]. It would, according to Enel, provide Albania with base-load power at competitive costs and make a decisive contribution to rebalancing the mix of the country's sources of power, which are currently almost entirely accounted for by hydroelectric facilities. It would also serve the market in Italy once new inter-connection lines between the two countries are completed.[2]

In September 2008 the environmental impact assessment (EIA) for the project, to be located in Porto Romano, near Albania's second largest city, Durres, was published and public consultations were held near the construction site in the village of Katundi I Ri. At the request of the NGO Coalition Ecolevizja, additional meetings were held in Durres and other administrative centres near the site between 21-27 January 2009[3]. During this process it became clear that, far from "also" serving the market in Italy, in fact 85 percent of the electricity would be exported, leaving only 15 percent to be sold to the Albanian Power Corporation at cost price.

Porto Romano

1 A figure which later rose to 1600 MW

2 Enel Annual Report 2007

3 http://www.albinformacion.com/ekonomi/Enel-e-detyruar-te-konsultohet-me-publikun-per-tec-in-e-durresit.php

Since the project became public in 2008, it has faced opposition from environmentalist groups that in April 2009 released a quality review highlighting more than 25 shortcomings of the EIA, including a lack of analysis of CO_2 emissions and socio-economic impacts and the lack of an Environmental Management and Monitoring Plan.

On 14 July 2009 the Albanian Council for Territorial Adjustment approved a plan for the development of an Industrial and Energy Park at Porto Romano, in which one of the most important developments would be Enel's coal power plant with an installed capacity of 1600 MW. However this was approved on the basis of a rapidly produced May 2008 EIA for the Industrial and Energy Park[4] that defined neither the capacity nor the fuel to be used in the power plant.

At the time of writing (early April 2010) the EIA for the project itself has not yet been approved, nor have the omissions in the EIA been addressed by the project promoter.

1.2. Technical overview of the project

According to the EIA the power plant would consist of two ultra supercritical[5] coal fired units of 800 MW each, of which 41 MWe (5.1 percent) would be for the TPP's internal use. The plant would have net efficiency of 44.7 percent. Electricity output per year will be about 13 TWh – twice as much as all the electricity produced in and imported to Albania in 2005, showing the enormous scale of the project.

The TPP would burn coal delivered to the site by boat, using a new 950 metre long pier adjacent to the site fence. Coal consumption would be about 240 t/h for each unit. For about 8 000 hours per year of operating time, the total quantity of coal used every year by the TPP will be about 3 850 000 tonnes (consumption for two units). South African coal has been considered as the reference fuel[6].

The plant would be connected to the Italian electricity grid by means of an undersea cable, through which 85 per cent of the electricity would be exported, and to the existing national power grid through the Tirana 2 substation by means of a 25 kilometre long 400 kV power line.

The proposed site is an area of about 80 hectares of flat greenfield land, located roughly 10 kilometres north of Durres, 25 kilometres north-west of Tirana. The area is rural but close to several industrial plants (i.e. oil and gas storage facilities and an associated pier). The mean elevation of the site is about the same as sea level.

Access to the site would happen via existing roads, accordingly widened, connecting the area to the Durres-Tirana highway. Some new roads are foreseen close to the site.

4 The study was produced by Landell Mills consultancy and co-financed by UNDP Albania and the Delegation of the European Commission to Albania. It is available at: www.bankwatch.org/documents/durres_energy_industry_park_rapid__EIA.pdf

5 Ultra-supercritical power plants operate at temperatures and pressures above the critical point of water. This results in higher efficiencies – about 45 percent

6 Porto Romano TPP Environmental Impact Assessment – Page 50

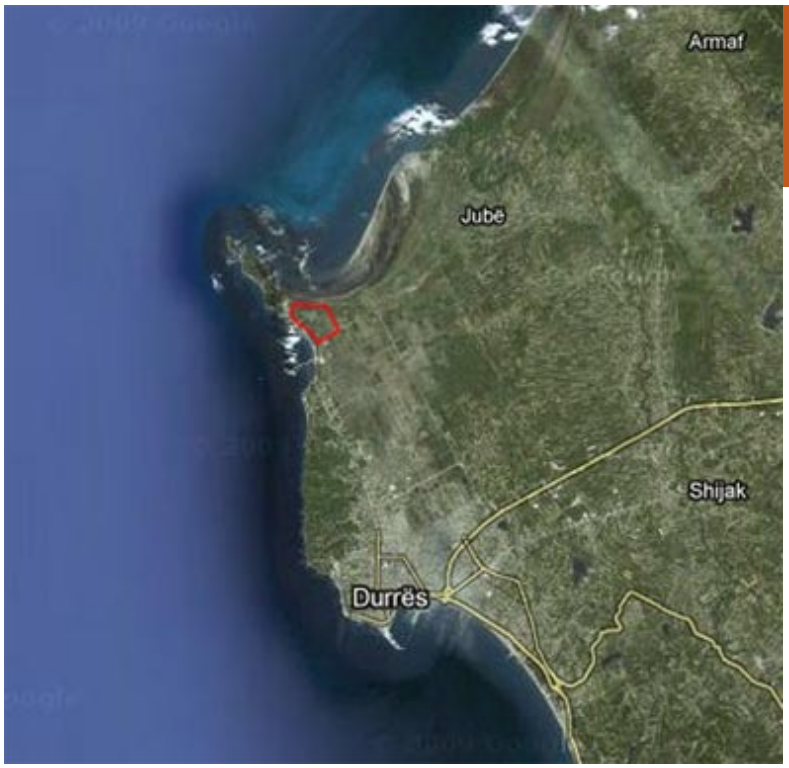
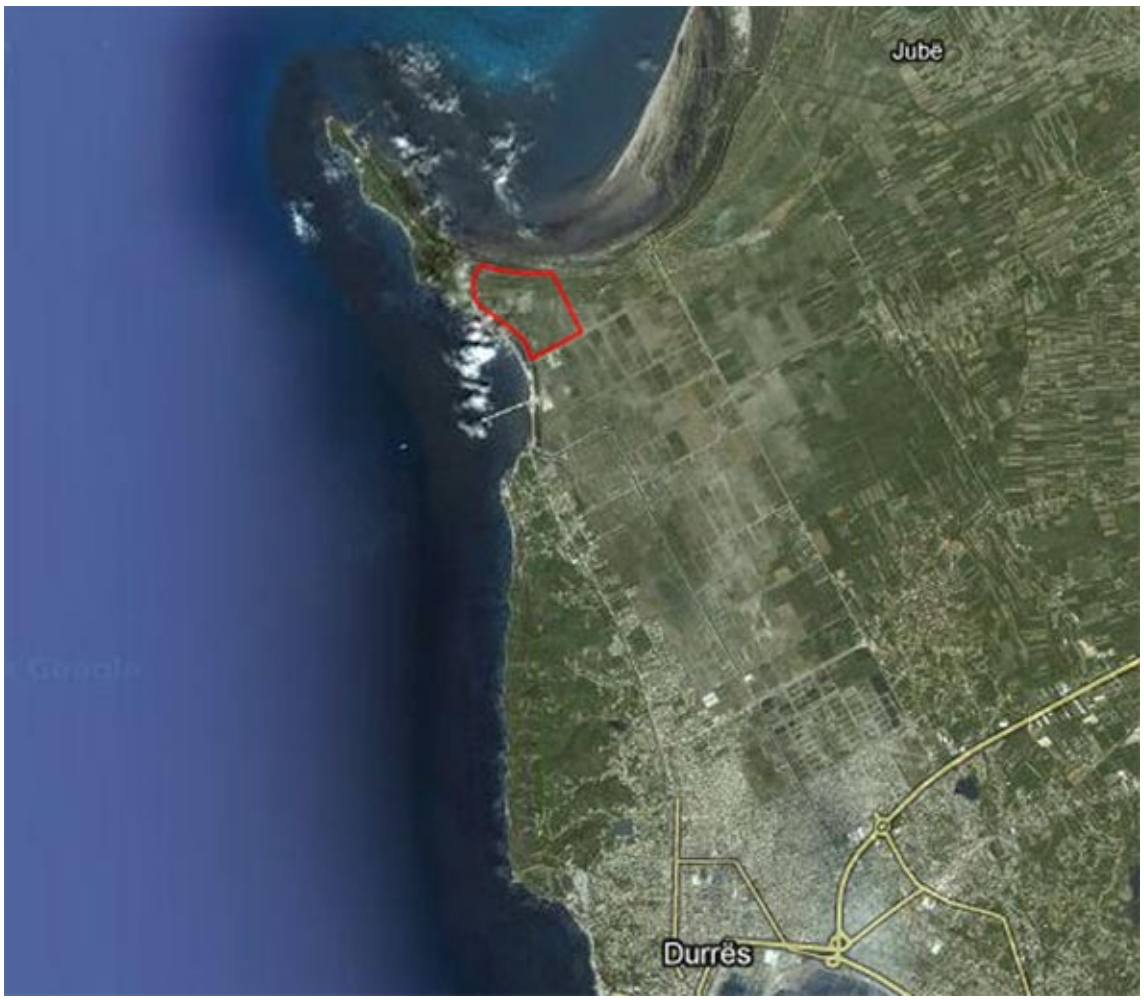


Figure 1 Proposed site location of the thermal power plant at the Porto Romano peninsula.



2. Scope and methodology of the study

Using existing project documentation and policy documents, this study assesses the Porto Romano TPP and its potential impacts on the energy security, economy and environment of Albania as well as the livelihoods of project-affected people. Where no information is available, the study assesses the information gaps to be filled. It also looks at the project's compatibility with the National Energy Strategy and current EU and international trends in the fields of energy and climate, in particular energy security, renewable energy and energy saving and climate reduction policies. Finally, the report presents alternatives to the Porto Romano TPP.

The most important documents on which this study is based are: EU energy policy documents, the Porto Romano EIA, the Rapid Environmental Assessment for the Industrial and Energy Park, the 2003 Albanian National Energy Strategy and the final draft of the Albanian National Energy Strategy, from 2006 (English version), which has never been approved but presents a more up to date picture than the 2003 one. Where data provided by the EIA is not sufficent to assess the impact of the project, e.g. in the climate impact section, calculations based on EIA data have been carried out.

3. The project's potential impacts on the economy, environment and affected communities

The authors of the EIA claim that the construction and operation of a new transmission line would bring benefits – both direct and indirect – to Albania's economy, as well as social and economic opportunities for the local communities directly affected by the project development.

The major social and economic benefits identified by the authors of the EIA are:

- The upgrading of infrastructure and services
- Opportunities for national and local economic growth
- Since the project would improve electricity generation and the exchange of capacity with neighbouring countries, it represents also an important and valuable partnership between Albania and European companies operating in the power sector.

Porto Romano TEP to bring economic boost to the local communities who base their lives mostly on farming and fishing. Photo by Hana Kuncova/Arnika

No specific Social Impact Assessment to assess in detail the positive and negative influence of the plant on the local economy and communities has been carried out yet. From the socio-economic point of view, referring again to the EIA study, the main effects of the project are employment opportunities and increased energy availability. The effects on employment are summarised below:

Construction phase: The project would constitute a source of revenue for Albanian sub-contractors. The construction phase would last approximately 49 months for each unit, and during this period approximately 1650 workers would be employed on average, with peaks of up to 2500 workers during intense construction activity periods and if both units are constructed with an interval of 6 months between their start-up. In total the construction work would last for 55 months. In the EIA it is not defined how many of these workers would be local or what level of education and training would be required.

Operational phase: During operation the power plant would employ approximately 140 people for the first unit, increasing to 220 workers when the second unit enters operation. An additional workforce employed by contractors would be operating constantly on site to provide services such as the canteen, cleaning, gardening and security.

3.1. Environmental impacts

The most important concerns cited in the EIA are:

3.1.1. Public health

The EIA presents sufficient data about the baseline national situation, based on a World Health Organisation study for Albania from 2005, and the baseline local situation with public health in Porto Romano, based on a report by the Ministry of Environment, Forests and Water Administration of Albania published in 2005. It should be noted that the Porto Romano area is already known as an environmental hotspot because of the presence of a former lindane factory which has contaminated the surrounding area. The EIA acknowledges the expected negative impact on public health caused by noise and emissions during construction and operation of the power plant. However, it fails to persuade the reader that the impacts on public health are acceptable or possible to mitigate.

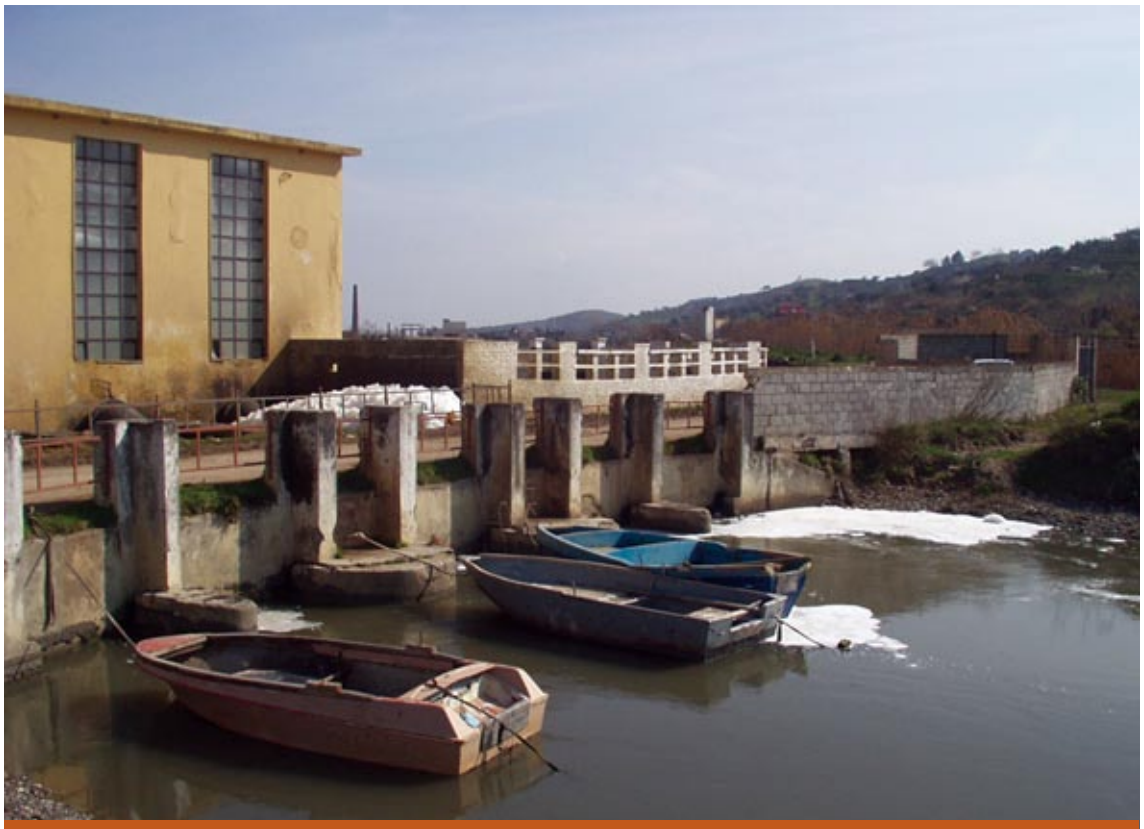
A cow grazing at the site of a former plant highly contaminated by lindane.
Photo by Hana Kuncova/Arnika

3.1.2. Air

According to the EIA the ground concentrations produced by the plant's operation would be always below the European and Albanian legal limits and would be comparable with the current state of air quality. At the same time the concentrations of Suspended Particulate Matter recorded at Durres air quality monitoring station already exceed European and Albanian limits[7], which means that the TPP will have a cumulative negative impact and the air quality would only get worse. From the point of view of air pollution it is therefore highly recommended to avoid construction of any new pollution sources.

3.1.3. Water

Sea water quality may be affected by sediments from the erosion and leaching of waste and the release of sludge, used oil, hydraulic fluid, paint, solvents and other similar materials. There may also be impacts on flood frequencies (above all in winter) due to the modification of the canal network. Water Thermal Discharge (discharge 53 m3/s at $\Delta T = 8°C$) may also have adverse effects on marine ecosystems.



Waste discharges at Porto Romano contaminating sea water.
Photo by Ladislav Kleger/Arnika

3.1.4. Impacts on cultural monuments

The authors of the EIA acknowledge the existence of cultural heritage sites near the project site. However, they do not discuss the possible adverse impacts of the project on these, nor possible mitigation measures. "*The Porta Romana wall, the sunken Hellenistic village and archaeological sites such as the Archaic temple, the possible location of the emporion and the prehistoric site were proposed for designation as national archaeological park. [...] The above mentioned archaeological*

7 Environmental Impact Assessment for the Porto Romano Energy Complex – Thermal Power Plant, Enel, Environmental Resources Management and 3E Ingegneria, September 2008, p.85

areas are located close to the Power Plant area (Figure 5.7.3a) but outside the perimeter of the site."[8]

3.1.5 Ashes

According to the EIA the TPP would produce 44 800 tonnes of bottom ashes and 401 600 tonnes of fly ashes annually. It is not specified what would happen to the ashes, but it is mentioned that "ashes could be removed by trucks or transferred by conveyor belt to the pier head, to be loaded on ships". It remains unclear if this ash is really going to be loaded on to ships and taken away – and if so, where – or disposed of somewhere locally, especially considering the fact that more than 65 percent of fly ash produced globally from coal power stations is disposed of in landfills[9]

The coal would be stored in two open-air piles, each about 450 x 60 metres, with a capacity of about 220 000 tonnes, and the limestone would be stored also in an open-air pile. The EIA does not discuss the nature of the surface on which these piles would be located, nor whether any soil protection measures are envisaged. No information on rehabilitation of the site is given. According to the EIA the Suspended Particulate Matter emission rates from wind erosion of the piles in the two stock areas would be 0.281 kg/h for coal and 0.0398 kg/h for limestone.

The EIA lacks adequate discussion on the proper management of the waste ashes and of the coal stored on the site. It lacks information on the different alternatives and mitigation measures.

3.1.6. Cumulative impacts

As mentioned above, there are other investment plans for the Porto Romano area, eg. a terminal for the storage of petroleum products and gas, a refinery, and other industries. Therefore the cumulative impact of all the envisioned industries on public health and the environment needs to be assessed. However, the Rapid Environmental Assessment which has already been carried out for the Porto Romano Industrial and Energy Park is insufficient, because it defined neither the size of the planned power plant nor the fuel to be used and could therefore predict none of the impacts in detail.

3.1.7 CO_2 emissions

The CO_2 emissions from the TPP would be 1166 tonnes per hour, that for 8000 hours of operation annually amounts to 9 328 000 tonnes/year[10]. The current CO_2 emissions of Albania are 5.5 million tonnes[11] without LUCF[12], so the emissions from the power plant would bring Albania to almost 15 million tonnes. This means that the GHG emissions of Albania would be increased 2.5 times compared to current emissions, and this as a result of only one TPP.

The EIA fails to address the climate impact of the investment, instead fudging the issue by stating that an area will be set aside for possible carbon capture and storage facilities.[13] This is, however, an unproven technology, which would need additional complex assessment for its feasibility (including identification of storage site, routes for pipelines connecting it with the TPP, social and environmental impacts of both, technology costs) and cannot be relied on. The plant will obviously contribute to the intensification of climate change, that is already

8 Environmental Impact Assessment for the Porto Romano Energy Complex – Thermal Power Plant, Enel, Environmental Resources Management and 3E Ingegneria, September 2008, p.140

9 http://www.us-concrete.com/news/features.asp

10 Environmental Impact Assessment for the Porto Romano Energy Complex – Thermal Power Plant, Enel, Environmental Resources Management and 3E Ingegneria, September 2008, p.50 and 52.

11 Sixth compilation and synthesis of initial national communications from Parties not included in Annex I to the Convention

12 Land Use Change and Forestry

13 Environmental Impact Assessment for the Porto Romano Energy Complex – Thermal Power Plant, Enel, Environmental Resources Management and 3E Ingegneria, September 2008, p.21

aggravating the situation in important sectors of the Albanian economy such as its energy sector (which, consisting largely of hydropower, is heavily dependent on hydrological conditions) and agriculture (supported by an irrigation system). Possible adverse impacts on Albania's position in the context of international climate negotiations and EU climate policy are described later in this study.

3.1.8 Inadequate alternatives in the EIA

The EIA study addresses a minimum of alternatives. Typical categories of alternatives that should have been included are:

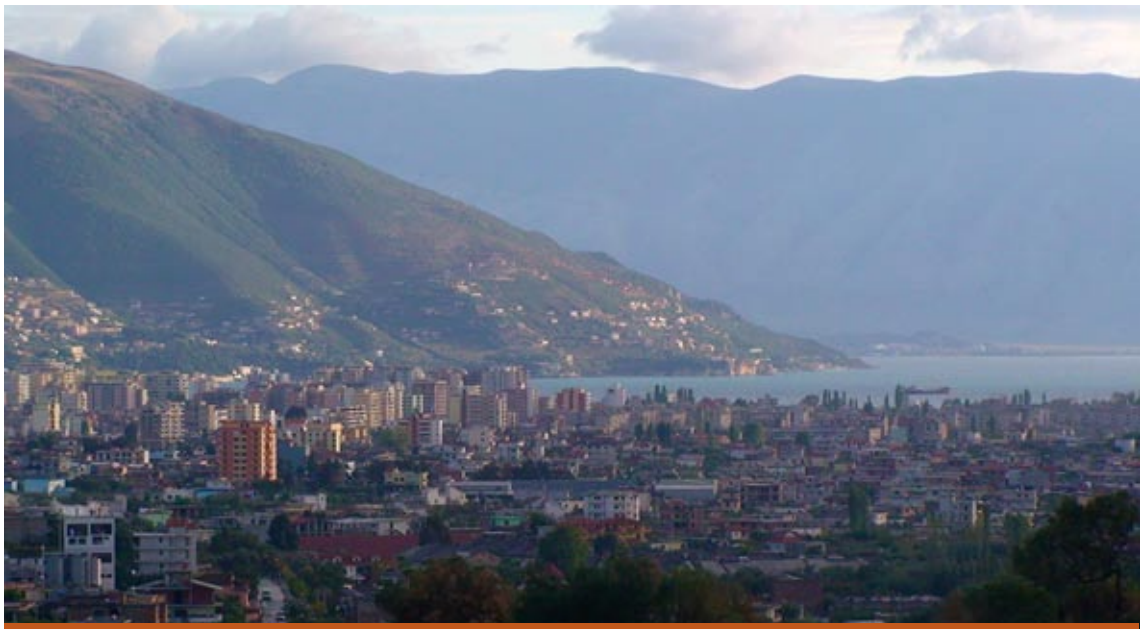
1. *Site location alternatives*
Three locations are taken into consideration: Porto Romano, Shengjin and Vlore. The locations are all on the Adriatic coast, and it seems that no other locations have been taken into consideration due to higher investment costs for the transmission lines.

2. *Design (fuel and technology) alternatives for the site*
No other design alternative has been considered in the EIA. There may have been different technologies, or different fuels, but it seems that, due to the fact that coal provides the cheapest solution (if externalities and carbon costs are not to be paid), coal has a head start over other fuels.

3. *Construction, operation, and decommissioning alternatives for the design*
No alternatives have been considered regarding the decommissioning of the plant.

4. *'No-project' or 'no-action' alternatives*
These alternatives have not been considered in the study.

5. *Timing alternatives relative to project construction, operation, and decommissioning*
These alternatives have not been considered in the study.



The sea resort of Vlora, considered as an alternative location of the Porto Romano power plant, already hosting a combined cycle thermo-power plant

3.1.9 Other omissions in the EIA

In addition, a quality review of the EIA commissioned by Ekolevizja[14] points out that a vital part of every EIA – the Environmental Management and Monitoring Plan – is inadequate. Even though Chapter 8 is entitled *Environmental monitoring plan*, it contains neither a real plan for monitoring nor for implementing mitigation measures and environmental management actions. There is no social impacts management plan, no waste management plan, no hazardous waste management plan, no decommissioning plan and no emergency/accident response plan – all of which should have been integral parts of the EIA.

The Project Description (Chapter 4) fails to provide key data on natural resource inputs (it considers only coal but misses out water consumption) and waste outputs during the operation phase of the TPP (including waste water quantities and thermal characteristics).

In short, there is no real analysis and comparison of alternatives. Instead, there is an attempt to justify the current project as the best solution, instead of realistically comparing different solutions with their respective economic, social and environmental effects. There is no proper comparison between different 'energy mix' scenarios on the national level.

The levels of air pollution and their effects on the local population have not been sufficiently analysed and described, and the assessment of the project's climate implications is extremely inadequate. It is also completely unclear what would happen to the ashes from the plant, and no attempt has been made to assess the cumulative impacts of a coal power plant with total power output totallimng 1600 MW in combination with the other planned facilities at the site.

Nor have the socio-economic impacts been analysed. There is no baseline analysis, no cost-benefit analysis and no project-related surveys carried out in the local settlements and towns. Instead the EIA promotes the idea of socio-economic benefits with very little analysis, giving rise to a threat that the economic benefits would be limited to the investor, while the social and environmental negative impacts would be borne by the local population.

3.2 Economic impacts

Eighty-five percent of the electricity generated by the TPP would be transmitted to Italy while 15 percent would be sold to Albania at cost price. This seems to be the basis of the arguments the Albanian government is using to support the construction of the Porto Romano TPP. However, it is not clear what the real benefits for Albania would be, as no cost breakdown analysis seems to have been done.

Considering that:

- The coal will be imported
- Presumably the technology used will be relatively expensive as it is being designed according to the Best Available Techniques applicable to this kind of Large Combustion Plant
- The capital cost may also include the cost of the undersea transmission line,

it is unclear whether cost price electricity would be a sufficient benefit for Albania or not.

According to Albanian tax legislation the Porto Romano TPP would not pay any taxes for the coal imported, because the coal would be considered a raw material used for the production of goods for export and would be exempted from taxes. This would decrease the cost of production, which would partly benefit Albania, but this gain may be cancelled out by the loss of tax.

14 Quality review of the EIA for the Porto Romano thermal power plant, Ekolevizja, March 2009, http://bankwatch.ecn.cz/project.shtml?apc=162059-2187636n--1&x=2187642

4. Porto Romano and the National Energy Strategy

The currently valid version of the Albanian National Energy Strategy (NES) was approved in 2003. In 2006, the National Agency of Natural Resources, convening an Inter-Institutional Work Group for Updating the National Strategy for Energy, updated the strategy and extended the forecasts up to 2020. For unknown reasons the updated version of the NES has not been approved yet.

The authors of the EIA for the Porto Romano TPP inventively claim that: "*the proposed project becomes part of the national energy strategy adopted by the Government, aimed at improving Albania's power transmission and distribution system, with the goal to ensure power supply to the population, trade and industry.*"[15]

This is a clear misrepresentation of the strategy: in neither scenario, in either the 2003 or 2006 versions, is coal foreseen as playing any significant role in Albania's energy future.

In section 2.1 of the 2006 NES it is stated that the *"Aim of [the] National Energy Strategy is the determination of the main directions of the development of a safe energy section, relying on market principles, for the meeting of the requirements for energy for consumers with minimal cost, taking into consideration certainty of supply, protection of environment and improvement of the well-being of the population".*

Among the six objectives of NES, three refer directly to sustainable development or environmental protection:

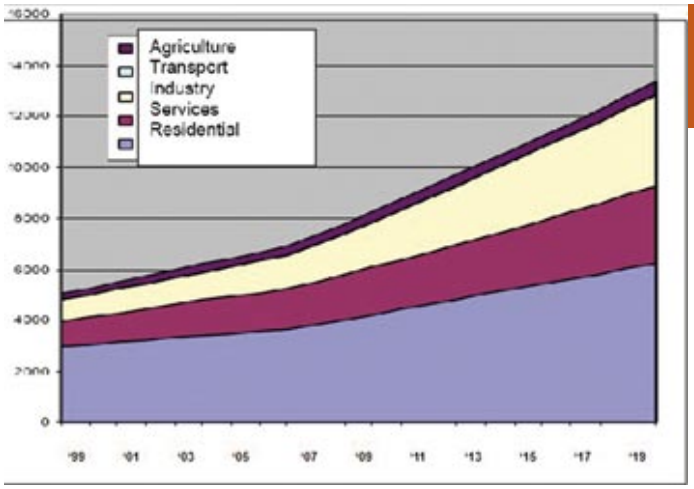
- *Objective two*: "Incitement of efficient and economic use of energy and *with a minimal effect on the environment*, in a way that the energy sector be a supporting sector for the steady development of all the other economic and social sectors."
- *Objective three*: "Optimising the system of power supply, relying on the concept of low cost planning and *minimal impact on the environment*."
- *Objective four*: "Incitement of the *use of renewable resources of energy* (solar, small power stations, wind, biomass) in order to make possible *the maximal use of the local resources*."

It is therefore clear that any new energy sector investments need to adhere to these principles. Whereas objectives two and three are somewhat elastic, building a 1600 MW coal fuelled TPP that runs on imported coal clearly goes against the fourth objective on the grounds of both renewability and local availability of the fuel.

4.1 Business as usual scenario (passive scenario)

The Business as Usual (BAU) scenario in the 2006 draft describes the implications of unrestricted growth of electrical power consumption. At the end of the forecasted period in 2020 demand is more than twice the level of 2006. Graph 1 displays a forecast for the needs of each sector.

15 Environmental Impact Assessment for the Porto Romano Energy Complex – Thermal Power Plant, Enel, Environmental Resources Management and 3E Ingegneria, September 2008, p.19



Graph 1: Forecast of electrical power needs for all sectors (GWh) up to 2020

The BAU scenario entails a slow reduction of transmission losses, totalling 15 percent in 2020 compared to about 35 percent at present. The electrical power demand in this scenario for 2020 is 13333 GWh, taking into account this high level of losses.

Installation of new installed capacity of 1089 MW is required in the BAU scenario, including HPPs and TPPs.[16] As the TPPs would consume considerable quantities of oil, thus increasing Albania's trade deficit, this scenario is seen as undesirable.

Vlora TPP. Photo by Aleksander Mita/ Civil Society Development Centre

According to this scenario the contribution of TPPs in electricity generation in 2020 is foreseen to be 25 percent, while the share of HPPs would fall to 75 percent; imports of electrical power would still have an increasing tendency up to 2020, requiring new facilities to be added throughout the period. The import value for the year 2020 is foreseen to reach 3077 GWh.

16 The total given in the graph showing new capacities in the NES is 1079, not 1089, but this is also inaccurate as can be seen by adding up the planned new capacities in the table.

Table 1: New electricity production capacity in the Business as Usual scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Existing HPPs	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445
SHPP	46.15	56.54	66.92	77.31	87.69	98.08	108.46	118.85	129.23	139.62	150
HPP Devolli 1			75	75	75	75	75	75	75	75	75
HPP Vjosa 1		80	80	80	80	80	80	80	80	80	80
HPP Drini1			84	84	84	84	84	84	84	84	84
HPP Vjosa2						75	75	75	75	75	75
TPP Fierit (first phase)	72	72	72	72	72	72	72	72	72	72	72
CCGT with oil distillate or natural gas	97 (Vlora)	97	97	435 (Fier II)	435	435	570	570	570	570	570
Total new capacity (the 2nd figures are the ones from the strategy which are incorrectly totalled - too low by around 27 each)	215.15 188.15	305.54 278.54	474.92 447.92	823.31 796.31	833.69 806.69	919.08 892.08	1064.46 1037.5	1074.85 1047.9	1085.23 1058.2	1095.62 1068.6	1106 1079

Source: National Energy Strategy, 2006.

As the total capacity from Vlora (97 MW) and phase II of the Fier rehabilitation (128 MW) total 225 MW, and it is estimated in this scenario that 570 MW new capacity is needed, there appears to be a shortfall of 345 MW, which the NES states would be filled by two new TPPs at as yet unknown locations. However these are foreseen to run on oil distillate or natural gas, not coal.

In addition, since the strategy was written there have seen several important changes influencing the need for additional new capacity:

- The Drin 1 or Bushati HPP has been redesigned to avoid affecting the water levels of the naturally valuable Lake Skadar, which has also reduced its installed capacity to 48 MW. It has also been re-named the Ashta HPP and a concession awarded to Verbund of Austria.[17]
- However, the Albanian government has awarded a concession to EVN/Statkraft for three hydropower plants on the River Devoll – not one – with a total installed capacity of 320 MW[18], not only 75 MW.
- It has also awarded a concession for the construction of Skavica HPP, with a capacity of up to 350 MW, to the TGK consortium from Italy, which is not foreseen by the strategy as it was supposed to be a long-term and less attractive option.
- A concession has also been awarded for the Kalivaci HPP on the Vjosa river, for a plant of 93 MW rather than 80 MW. It is planned to enter operation at the end of 2012.[19]
- Wind projects with a total capacity of more than 1400 MW have also been granted concessions, however it is unclear how much of this capacity is dedicated to the Albanian market and how much for export, so they are not included below.

A roughly adjusted version of the table above, therefore, may look as follows, taking into account that the timeline for the new HPPs entering operation is not always clear:

17 Sobek, Martin: Ashta Hydropower—Turning a Doubtful Concept into a Technological Trailblazer, IFC SmartLessons, May 2009. http://www.ifc.org/ifcext/psa.nsf/AttachmentsByTitle/Smartlesson_Sobek/%24FILE/Smartlesson_AshtaHydropower_MSobek.pdf

18 Presentation by EVN, 10 April 2009, www.alblink.com/.../1239463831-20090410145111_prezantimi_evn.pdf

19 Presentation by Fatjon Tugu, Ministry of Economy, Trade and Energy: Investing in Energy Efficiency and Renewable Energy in the Energy Community, 18th March, 2010.

Table 2: Updates in the Business as Usual scenario since the NES was written

	2020
Existing HPPs	*1445 MW*
SHPP	150
HPP Devolli x 3	320
HPP Kalivaci (Vjosa 1)	93
HPP Ashta (formerly Drin 1)	48
HPP Vjosa2	75
HPP Skavica	350
TPP Fierit (first phase)	72
CCGT with oil distillate or natural gas	225 (Vlora 97, Fier II 128)
Total new capacity	**1333 MW**

Source: Own calculations, based on recent developments in the Albanian energy sector.

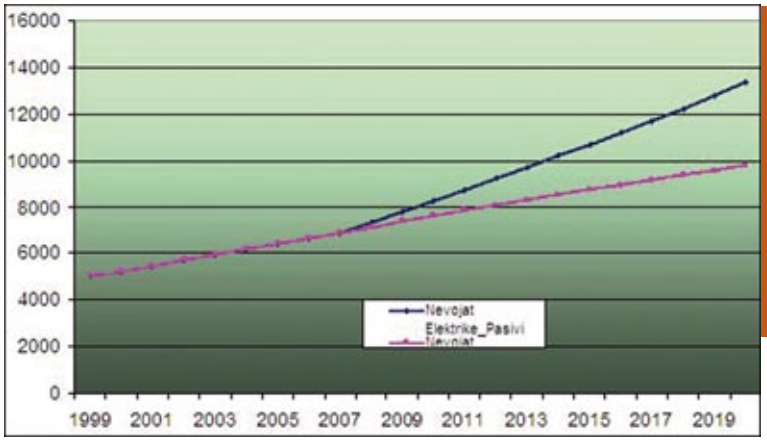
While we may question the wisdom of further reliance on hydropower, these plants will nevertheless provide significant extra capacity. They will certainly take several years to enter operation, though the Porto Romano plant would not enter operation any sooner. It is therefore clear that even in the BAU scenario, which the NES counts as something to be avoided, no new coal capacity is foreseen or necessary.

4.2 Active scenario

The Active scenario (Chapter 3 of the NES) sets out the following objectives:

- Boosting security of supply
- Boosting energy efficiency
- Diversification of energy resources
- Increased use of renewable resources
- Introducing market-based prices for electrical power
- Implementation of the regional market for electrical power
- Environmental protection.

Various energy-saving mearures described in this scenario lead to a significant reduction of electricity demand as compared to the passive scenario. According to the active scenario, in 2020 demand will be 9796 GWh only, while the passive scenario foresees 13 333 Gwh.



Graph 2: Total of economisation of electrical power from the implementation of efficiency measures [GWh]

Blue line: electricity needs, passive scenario

Pink line: electricity needs, active scenario

For the next few years the NES active scenario sees it as inevitable that Albania will continue to import electricity from neighbouring countries of the region, as it will take several years for the construction of new generation capacity. However, in order to increase the security of supply, decrease import dependency, and mitigate the problems with the existing HPPs during dry periods, the NES sees the need to increase capacity with a total new installed capacity of HPPs and TPPs by 2020 of 896 MW, out of which would come 389 MW from HPPs (among them 150 MW SHPP) and 507 MW TPPs. 435 MW should also come from a combined cycle TPP fuelled by distillate fuel oil, with the option to switch to natural gas.

Table 3: New capacity investments in the active scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
SHPP	46.15	56.54	66.92	77.31	87.69	98.08	108.5	118.9	129.2	139.6	150
HPP Devolli 1			75	75	75	75	75	75	75	75	75
HPP Vjosa 1		80	80	80	80	80	80	80	80	80	80
HPP Drinj 1			84	84	84	84	84	84	84	84	84
TPP Fier 1	72	72	72	72	72	72	72	72	72	72	72
TPP CCGT oil distillate or natural gas	97	97	97	435	435	435	435	435	435	435	435
Total new capacity	215.2	305.5	474.9	823.3	833.7	844.1	854.5	864.9	875.2	885.6	896.0

Source: National Energy Strategy, 2006.

Table 4: Updates in the active scenario since the NES was written

	2020
Existing HPPs	*1445 MW*
SHPP	150
HPP Devolli x 3	320
HPP Kalivaci (Vjosa 1)	93
HPP Ashta (formerly Drin 1)	48
HPP Skavica	350
TPP Fierit (first phase)	72
CCGT with oil distillate or natural gas	225 (Vlora 97, Fier II 128)
Total new capacity	**1258 MW**

Source: Own calculations, based on recent developments in the Albanian energy sector.

According to recent developments in the Albanian energy sector that mainly grant concessions for the construction of new HPPs, new capacities for energy generation to be constructed in Albania exceed the amount envisaged by the active scenario.

In conclusion, it should be stressed that in neither scenario of the NES is the construction of a coal-fired power plant such as Porto Romano TPP foreseen. This means that the Porto Romano TPP not only lacks justification in the NES but also contradicts it, becuse it alters the path of energy sector development envisaged by the document. The reasons why coal is not the best option for Albania are indeed clearly explained in the NES:

- The lack of local coal resources, so investment in a coal-fired TPP would increase dependence on imports
- Environmental sustainability
- The existence of numerous other options to match increasing demand as well as the diversification of electricity sources.

4.3. Weaknesses of the strategy

As we have seen above, although the NES is so far the most comprehensive document on the energy sector of Albania, in some parts it has already become obsolete. Some of the points which the NES has failed to fully address are:

- International forecasts predicting a long-term dramatic increase of fossil fuel prices
- Progress in the development of renewable energy technologies
- The potential of small hydro power plants is underestimated – by March 2010, concessions for 344 MW of hydro plants of less than 15 MW were already under development or had already been approved, much more than foreseen by the NES.
- The use of other renewable energy sources such as biomass in small scale is also underestimated. In other studies the potential of biomass[20] for Combined Heat and Power goes up to 400 ktoe/year.
- As seen above the NES omits recent developments in the HPP sector such as the granting of new concessions for the development of HPPs on the Devolli River and Drin River as well as the concessions for the development of wind parks.
- Aspects other than economic ones regarding the development of large HPPs were not considered, i.e. social and environmental external costs.
- A comprehensive explanation of the profits Albania may gain from the Clean Development Mechanism (CDM) under the Kyoto protocol. The UNDP estimates that this investment potential could reach USD 19 to 32 million per year[21].

These weaknesses, especially not taking into account recent developments in Albania in the fields of wind and hydro energy, would point to a need to update the strategy in line with the current situation. However the recent changes would suggest that Albania is now *less* – rather than more – likely than in 2006 to need a coal-fired TPP such as the one proposed at Porto Romano.

20 Study on Assessment of renewable energy sources potentials in Albania (2006). Co PLAN Institute for Habitat Development, Tirana, Albania.

21 Climate Change and Albania, UNDP Albania, 2007.

5. European and international trends in the fields of energy and climate

In recent years the threat of disastrous climate change has entered the mainstream of international and European politics. The Intergovernmental Panel on Climate Change (IPCC) has no doubt that, in order to keep the temperature increase below 2° Celsius compared to pre-industrial levels and avoid catastrophic, runaway climate change, a dramatic reduction of emissions must happen very quickly: 80-95 percent reductions in the developed countries (Annex I countries – under the Kyoto Protocol) by 2050 and a substantial decrease compared to business as usual in the rest of the world[22].

In line with the IPCC recommendations, in a number of resolutions the European Parliament has called on the EU and other industrialised countries to reduce their GHG emissions by at least 80 percent by 2050, compared to 1990 levels[23]. The European Council, the highest decision-making body of the EU, has called for at least 50 percent worldwide reductions and aggregate developed country emission reductions of at least 80-95 percent by 2050[24]. Many developing countries are asking the industrialised world for deeper or even negative cuts in the upcoming decades to ensure an equitable distribution of targets.

As a result of the Copenhagen Accord both developed and developing countries need to register their non-binding near-term mitigation commitments at the Secretariat of the UNFCCC[25]. This is a temporary mitigation measure before the next UNFCCC summit in Mexico in 2010.

At the same time, in the United States President Obama and Congressmen in the House and Senate are working to reduce climate-altering CO_2 emissions by 80 percent by 2050, and invest 150 billion dollars in new energy-saving technologies[26]. However, the mid-term targets by 2020 will only ensure the return of US emissions to 1990 levels or slightly below.

It is also telling that the foreword of the World Energy Outlook, the main annual report of the International Energy Agency (IEA), an organisation not usually associated with ecological thinking, in 2009 concentrated on the challenge of stopping anthropogenic climate change. The Chief Economist of the Agency writes: "Collective action to tackle climate change calls for a wholesale transformation of the global energy system. We show here that limiting global average temperature increase to 2° Celsius, which a growing number of world leaders now accept as the ultimate goal, would require fossil-energy consumption to peak by around 2020 and then decline"[27].

22 Fourth Assessment Report Working Group III Report „Mitigation of Climate Change. Intergovernmental Panel on Climate Change, 2007, Chapter 13.

23 Resolutions: 2050: The future begins today – recommendations for the EU's future integrated policy on climate change, P6_TA(2009)0042, European Parliament, 4 February 2009, An EU strategy for a comprehensive climate change agreement in Copenhagen and the adequate provision of financing for climate change policy, P6_TA(2009)0121, European Parliament, 11 March 2009.

24 Council of the European Union, Presidency Conclusions 1 December 2009 (15265/1/09).

25 Major emitters set carbon goals after Copenhagen, Reuters, February 02, 2010.

26 Obama affirms climate change goals – The New York Times, November 18, 2008.

27 World Energy Outlook 2009 - International Energy Agency.

It is clear that the Porto Romano TPP project being promoted by the Albanian government together

with Enel contradicts these worldwide trends and sets Albania on an unsustainable pathway instead of developing in a low-carbon direction. It is also clear that Enel's interest in the project is not in providing electricity to Albania, but in exporting its pollution to avoid paying for GHG emissions under the ETS.

5.1 Albania's situation in light of the UNFCCC convention

The current CO_2 emissions of Albania are 5.5 million tonnes[28] without LUCF[29], and the emissions from the Porto Romano TPP would bring Albania's overall emissions to almost 15 million tonnes[30]– more than 3 tonnes per capita. In other words, Albania's GHG emissions would be increased by more than 2.5 times compared to the current emissions, and this by only one TPP.

In December 1997, the Conference of the Parties of the UN Framework Convention on Climate Change (UNFCCC) concluded the Kyoto Protocol, which entered into force in February 2005. The Kyoto Protocol shares the same objective as the Convention – to stabilise the quantity of GHGs in the atmosphere – and it imposes legally binding commitments for 38 industrialised countries (Annex I countries), considered to be the main contributors of increased GHGs in the atmosphere due to human activities. The Protocol asks these countries to take action to reduce their GHG emissions[31] during the first commitment period 2008-2012, by 5.2 per cent as a group below their 1990 emissions level. The non-Annex I countries under the Kyoto Protocol do not have any legally binding emissions target, but do share some other minor duties vis-a-vis the Convention.

Albania is one of them. Albania's CO_2 emissions are increasing fast and will probably reach the 1990 level soon[32].

The Kyoto Protocol defines emission targets only until 2012. There are ongoing negotiations under the auspices of the UNFCCC aiming at agreement for the subsequent period. The latest attempt to agree on a new document in Copenhagen was not successful. It is still not clear what kind of agreement will emerge, but there is a wide-ranging consensus that even non-Annex I countries, like Albania, will have to take on new commitments and reduce, stop increasing or at least reduce the growth rate of their emissions in a decade or two.

The position of the EU for climate negotiations expressed by the Council of the EU says that the new agreement "should contain binding quantified emission limitation or reduction commitments for at least all Parties listed in Annex I to the UNFCCC and all current EU Member States, EU candidate countries and potential candidate countries that are not included in Annex I to the UNFCCC"[33]. If Albania is seriously thinking about its EU membership, the accession process may

28 Sixth compilation and synthesis of initial national communications from Parties not included in Annex I to the Convention

29 Land Use Change and Forestry

30 According to the Kyoto Protocol non-Annex I countries are those that have no GHG emission restrictions, but have financial incentives to develop GHG emission reduction projects to receive "carbon credits" that can then be sold to Annex I countries, encouraging sustainable development

31 The Kyoto Protocol focuses on six greenhouse gases: Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydrofluorocarbons (HFC_s), Perfluorocarbons (PFC_s), Sulphur hexafluoride (SF_6)

32 There are no detailed data for all the GHG emissions in Albania in 1990. The estimates for energy-related CO_2 emissions show that after a decrease of emissions at the beginning of the 90s there was a dramatic increase, mainly due to the development of transport. (Energy in the Western Balkans: The Path to Reform and Reconstruction, International Energy Agency 2008.)

33 Council Conclusions on the further development of the EU position on a comprehensive post-2012 climate agreement (Contribution to the Spring European Council), 2928th Environment Council meeting, Brussels, 2 March 2009

result in pressures to transpose EU climate legislation and adopt a domestic climate change policy.

Depending on the outcomes of the climate talks on the post-2012 climate regime it is highly probable that in the near future the Albanian government will have to start considering restrictions in GHG emissions. This may bring hard choices between industry, transport and agriculture producing for Albania's needs and TPPs like Porto Romano exporting energy to Italy. In this context it is important to note that until now the reference year for emission reductions under the Kyoto Protocol was 1990. Currently Albania's CO_2 emissions are almost at the 1990 level and with Porto Romano TPP on line they will be more than 2.5 times higher.

In addition, warming of the climate system is unequivocal. In the coming decades, Albania is projected to face rising average temperatures, increasing risk of heat waves resulting in drought and forest fires, intense precipitation events, decreased annual average precipitation as well as rising sea levels[34]. Hence it is unwise for Albania to invest in long-term technology which contributes to the aggravation of the problem it is facing. Albania will also soon need to seriously consider its adaptation strategy, for which it may wish to seek out international funding opportunities, including those under the UNFCCC.

5.2 The Kyoto Protocol and Italy

Italy is an Annex I country. The Kyoto objective for the EU (EU-15) is to achieve 8 percent emissions reductions for the period 2008-2012. The Italian target is to reduce GHG emissions by 6.5 percent until 2012, compared to the 1990 level. The latest available inventory year (2005) reports a 12.1 percent emissions increase compared to 1990. In the energy sector CO_2 emissions in 2005 were 14.5 percent greater than in 1990[35].

The Italian energy sector is part of the EU's EYS, which forces utilities to buy emission allowances and thus to pay for carbon pollution. In December 2009 the market price of one tonne of CO_2 equivalent costs about EUR 15, which is set to rise in the near future.

Avoiding further increases of GHG emissions is the main reason why Italian energy companies like Enel are so determined to produce energy for Italian customers outside of the country's borders. In effect electricity is transmitted to Italy, while responsibility for pollution stays in other countries, which do not have emission restrictions – in this case Albania. This is a process known as "carbon leakage".

5.3 European Energy and Climate Targets and the Emission Trading Scheme

European integrated energy and climate policy is a complex set of political commitments, legally binding legislative acts, strategies and international commitments. As stated in the conclusions from a 2007 meeting of European Council, the highest decision-making body of the EU, it is based on "the strategic objective of limiting the global average temperature increase to not more than 2°C above pre-industrial levels."[36]

34 http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/ALBANIAEXTN/0,,contentMDK:221573 77~pagePK:141137~piPK:141127~theSitePK:301412,00.htmlWorld Bank press release: Albania to Assess Climate Change Risk to Energy Sector, 10 March 2009, http://beta.worldbank.org/node/3693

35 Fourth National Communication under the UN Framework Convention on Climate Change, Italian Ministry for the Environment, Land and Sea (2007), p. 10.

36 Council of the European Union, Presidency Conclusions 8/9 March 2007 (7224/1/07).

The same meeting set the energy and climate targets, which have become the backbone of the integrated energy and climate policy. They include:

- 20 percent renewable energy share in overall EU energy consumption by 2020,
- the inclusion of 10 percent renewables in transport in each of the member states,
- a 20 percent reduction in GHG emissions by 2020, for the whole EU 27 compared to 1990 levels
- an indicative target of a 20 percent decrease in energy consumption, compared to projections for 2020.

These targets, often called the EU 20-20-20 targets, are being introduced by a number of legal (Directives and Regulations), political (non-binding commitments and action plans), scientific (research), educational and market based measures.

The EU's ETS is one of the principal instruments that the EU is relying on to meet its GHG emissions reduction requirements under the Kyoto Protocol (until 2012) and later under one of the 20-20-20 targets.

Currently, the Scheme covers carbon dioxide emissions from more than 10 000 installations in the energy and industrial sectors from the EU's 27 Member States plus, as of 2008, Norway, Iceland and Liechtenstein – members of the European Economic Area. Together the installations account for about 40 percent of the EU's GHG emissions.

The legislation that launched the EU ETS in 2005 was approved by the European Council and the European Parliament in 2003. Emission rights, called EU allowances (EUAs), are permits equivalent to one tonne of emitted carbon dioxide equivalent[37]. Member States allocate allowances to their regulated installations in accordance with National Allocation Plans (NAPs), which are approved by the European Commission. At the end of each year installations falling under the ETS must surrender allowances equivalent to their emissions. Surpluses and shortfalls can be matched through sales and purchases on the EU-wide market. Emitters who fail to match their emissions with allowances received under the NAPs or bought on the market pay a penalty of EUR 100 per tonne, which will be increased after 2013.

Until 2012 NAPs for each of the country should, among other criteria defined in the EU ETS Directive, contribute to reduction of emissions as stated in their Kyoto Protocol commitments. After 2012, when the Kyoto Protocol expires, NAPs will be abandoned. Instead the European Commission will set one cap for emissions in the whole EU. In order to reduce overall emissions the cap will be reduced by 1.74 percent annually.

Today around 90 percent of emission allowances are handed out to industrial installations for free. According to the ETS Directive after the 2012 the share of freely distributed allowances will systematically decrease. For example the power sector will have to buy all its allowances from 2013, with a few years derogation for 10 new member states. This means that there will be fewer and fewer allowances available for free and emitters will more often have to pay for all the emissions they produce, not only when they exceed the amount of EUAs received under the NAP.

The EU ETS is slowly getting closer to the principle that the polluter pays for emissions and that this price increases with time. This cost is at the end transmitted to the consumer – in the case of the power sector, to people buying electricity.

37 From 2013 on the emission of two new greenhouse gases (nitrous oxide and perfluorocarbons) will enter the scheme in some sectors.

5.4 Emissions restrictions and Enel

As one of the biggest emitters in Italy, Enel also has obligations to reduce its GHG emissions, if it wants to avoid buying emission allowances on the market or paying high penalties. The Kyoto Protocol allows companies in Annex I countries to fund emissions-cutting projects in developing countries to get carbon allowances to offset their own pollution. This mechanism is called the Clean Development Mechanism (CDM). By mid-2008 Enel had carried out 60 projects of this kind in China alone, claiming that they will reduce Chinese emissions by 70 million tonnes in the years 2007-2012[38].

We do not know the overall cost of these investments, but if using the price of credit per tonne of CO_2 disclosed by an Enel official to Reuters (EUR 8 per tonne)[39] for the recent investment in China, it would cost EUR 560 million.

If constructed, Porto Romano TPP would emit approximately 9.3 million tonnes/year of CO_2. If Enel emits CO_2 in Albania, it does not have to pay for its emissions as it would in Italy. Producing the same amount of electricity in the same coal TPP in Italy would oblige Enel to buy carbon credits. Taking the price of carbon credits from the deal with China (EUR 8 per tonne), thanks to Porto Romano Enel would save EUR 74.4 million per year. Taking the December 2009 price of EUAs – s EUR 15 per tonne – the savings would be EUR 139.5 million yearly. Forecasts for 2020 predict prices of between EUR 25 and 35 for EUAs[40], which translates to savings worth between EUR 232.5 and 325.5 million.

5.5 Conclusions on European and international trends in energy and climate

There are many uncertainties concerning the responsibility for GHG emissions which Albania will have to bear in the long term. They depend on a number of factors like the form of the post-Kyoto international agreement, Albania being part of the EU or not, the shape of the EU ETS, the price of carbon credits on the international market, and so on.

What is clear is that international and especially European trends are transferring more and more financial responsibility for GHG emissions to emitters. The EU aims to become the world leader in fighting climate change, hence, if it wants to be a part of the EU, Albania in the long term will have to reduce its emissions as well to some degree.

Under the EU ETS the reduction of emissions is not only a financial issue for private companies, but also for consumers who buy the products they produce. According to the Directive on ETS, every year the number of allowances, both auctioned and distributed for free, will decrease, their market price will be increasing, so electricity produced from fossil fuels will be more and more costly. The burden of this increase will be passed on to consumers.

In this way Albania may lose its historic chance to keep its economy low-carbon and competitive and end up in a long-term lock-in of carbon-intensive energy production.

In addition, in the coming decades, Albania is projected to face rising average temperatures, increasing risk of heat waves, and intense precipitation events, decreased annual average precipitation as well as rising sea levels[41]. Hence it is unwise for Albania to invest in a technology which contributes to aggrevation of the problem it is facing.

38 Agreements signed in China for the reduction of greenhouse gases, Enel Press release 5.5.2008.

39 Enel buys $232 mln carbon credits from Wuhan Steel, Reuters 5.5.2008

40 European Climate Exchange forecast according to presentation delivered by Matthew Cowie from New Energy Finance, workshop on EU ETS, Warsaw 27 January 2010.

41 World Bank press release: Albania to Assess Climate Change Risk to Energy Sector, 10 March 2009, http://beta.worldbank.org/node/3693 http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/ALBANIAEXTN/0,,contentMDK: 221573 77~pagePK:141137~piPK:141127~theSitePK:301412,00.html

The motivation for Enel and the Italian government – the biggest shareholder of the company – to construct a new power plant in Albania instead of Italy is clear: avoiding a further increase of GHG emissions in Italy. In effect the electricity would be transmitted to Italy, while the responsibility for the pollution (and the pollution itself) would stay in Albania, which at the moment does not have emissions restrictions.

6. Clean energy alternatives for Albania

Current problems with the electricity supply in Albania are real and serious. Short term solutions need to be found fast. But the construction of Porto Romano TPP will not bring short-term solutions because a new TPP of this size can start producing electricity only after a process of several years for obtaining all the permits, securing financing, building and testing.

Due to this our description of alternative solutions is restricted to the medium and long term perspectives.

Short term peak demand may be covered through imports, which will be easier after two 400 kV new interconnectors with Montenegro (Elbasan-Tirana-Podgorica – under construction) and Kosovo (Tirana-Kosovo B power plant – design phase) are completed. An International Energy Agency study on the Western Balkans energy system[42] estimates that these new lines will increase Albania's import capacity by 50 percent from 380 MW to 600 MW, which is almost half of current peak demand (1 300 MW).

6.1 Alternatives in the National Energy Strategy

Although the EIA Study presents the main aim of the project as being "to build a new plant in order to improve Albanian power generation development, using an energy source common and cheap, able to support the Albanian economic development and improve the existing critical situation", Enel admitted during public hearings that Albania would take only 15 percent of the electricity generated by the TPP, which in terms of installed capacity is about 240 MW or 1920 GWh/year. This would be bought at cost price, although it is not known what the cost will be.

The alternatives to this development are given in the active scenario of the NES, including energy efficiency measures, fuel switching, and better management of energy sources and use of renewable energy sources.

Regarding the implementation of energy efficiency measures and better management of energy sources where applicable, the NES points out:

"*A specific impact on the reduction of the demand for energy in the active scenario according to sectors comes from the contribution of the economisation of the electrical power which is foreseen to go up to 9796 GWh against the level of 13 333 GWh which is foreseen in the passive sector in 2020. In reducing the demand for electrical power, the factors which shall have an impact shall be: implementation of the efficiency measures in different sectors of economy, through the realization of the investments to this effect, penetration of the alternative and competing energy resources which shall bring about reduction of the electrical power and the use of renewable energies. In 2020 this economisation is foreseen to reach the value of 3537 GWh.*"[43]

In addition, savings of energy resources from energy efficiency measures alone is foreseen to reach 1105.2 ktoe (both in electricity and other energy sectors).[44]

42 Energy in the Western Balkans: The Path to Reform and Reconstruction, International Energy Agency 2008.

43 Chapter 3, Section 1.1.6. National Energy Strategy of Albania, 2006 draft, English version

44 Ibid.

The measures foreseen are outlined in the table below. While it is curious to see Liquid Natural Gas penetration referred to as an energy efficiency measure, and it is questionable whether this is an economically wise direction to go with a medium-long term rise in fossil fuel prices expected, it is positive that the government plans to reduce the use of electricity for heating and cooling.

Table 5: Investments required into energy efficiency measures in all economic and social sectors

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Investments for penetration of Liquid Natural Gas [Million EUR]													
3.39	4.04	4.75	5.47	6.27	7.03	7.84	8.70	9.57	10.43	11.29	12.15	13.01	13.87
Investments for implementation of thermal insulation [Million EUR]													
2.82	3.15	3.48	3.83	4.18	4.55	4.92	5.30	5.69	6.07	6.46	6.84	7.23	7.61
Investments for penetration of solar panels [Million EUR]													
9.97	10.84	11.88	13.19	14.18	15.56	16.73	18.16	19.34	20.51	21.68	22.85	24.02	25.20
Investments for penetration of District Heating & Small Scale Combined Heat and Power Facilities [Million EUR]													
3.77	5.25	6.07	7.05	8.28	9.84	10.41	10.82	11.48	12.13	12.79	13.44	14.10	14.75
Investments for penetration of efficient lighting [Million EUR]													
1.08	1.20	1.34	1.49	1.66	1.84	2.04	2.26	2.66	3.05	3.44	3.84	4.23	4.62
Investments for penetration of efficient ovens/heaters [Million EUR]													
1.89	2.06	2.22	2.39	2.53	2.69	2.83	2.94	3.04	3.14	3.24	3.34	3.43	3.53
Investments for boosting the power factor [Million EUR]													
0.76	0.89	1.02	1.15	1.28	1.40	1.53	1.66	1.92	2.17	2.43	2.68	2.93	3.19
Investments for public transport and other efficient measures in transport [Million EUR]													
12.45	16.83	21.88	27.45	33.43	39.97	46.86	54.27	62.14	70.01	77.88	85.75	93.62	101.49
Investments for efficient measures in agriculture [Million EUR]													
4.10	5.40	6.80	8.20	9.70	11.30	130	14.80	16.60	18.40	20.20	22.00	23.80	25.60
Total investments required for the implementation of the efficiency measures in all economic and social sectors [Million EUR]													
40.24	49.65	59.43	70.21	81.51	94.17	106.1	118.9	132.4	145.9	159.4	172.8	186.3	199.8

As for renewable energy, according to the NES, the total capacity of small HPPs needed is calculated at 150MW. This corresponds to an annual production of energy of 717 GWh. It has already been mentioned above that this is an underestimate compared to the concessions already being handed out. Solar energy offers significant potential in Albania and the active scenario estimates that the contribution of solar energy will rise from 2.2 ktoe in 2003 to 74 ktoe in 2020 (1 ktoe = 11.63 GWh).

The investments in the table above will be paid mainly by private investors, and this will help not only in energy saving and environmental protection, but also in the creation of jobs in the service sector which is of vital importance for Albania. The renewable energy industry is much more labour intensive than the conventional energy industry. In this context, a TPP would provide employment opportunities only for a small number of people, but at the same time it

would compromise the possibilities for the creation of other jobs by slowing down investments in renewable energies.

As the NES states that up to 3537 GWh/year can be saved by improved efficiencies on electricity alone, while Albania would take 1920 GWh/year from the Porto Romano TPP, it is clear that there are more socially beneficial ways of providing adequate electricity for Albania than the construction of coal-fired TPPs.

6.2 Other alternatives

The active scenario of the NES draws up an ambitious plan for a more efficient use of energy resources in Albania. The implementation of this plan would be the first step that has to be taken to overcome the country's energy crisis. However, as mentioned above, the NES does not take into account recent developments in the energy sector in Albania.

First, it does not accurately reflect concessions already granted for the construction of new HPPs and windfarms. As mentioned above, concessions have been awarded for HPPs on the Devolli River (total 320 MW) to be built by a consortium of the Austrian EVN and Norwegian Statkraft; Ashta HPP (48.2 MW) to be built by Austrian company Verbund on the Drin river; Skavica (350 MW) to be built by TGK of Italy, and Kalivaci (93 MW) on the River Vjosa.

If only these investments recently granted concessions are taken together, they amount to over 800 MW of new generation capacities.

At least 74 concessions have also already been granted for HPPs of less than 15 MW[45] each. Wind power licenses for more than 1400 MW of new generation capacity have been distributed. These comprise: a 500 MW export-oriented wind park on the unspoilt Karaburun peninsular in Vlora[46]; the Lezha wind park with a capacity of 234 MW planned by Marseglia group of Italy; seven more wind parks built by six investors with a capacity of 676 MW[47]. In addition a biofuel TPP with a capacity of 140 MW is also planned by the Marseglia group in Lezha.[48] However it is unclear to what extent these projects will contribute to the Albanian electricity supply and how much will be exported.

The NES not only omits recent developments in the sector, but also does not sufficiently recognise the potential of renewables other than hydropower. As a part of the GreenNet-Europe programme financed by the EU Commission, the potentials for the development of renewables in the Western Balkans and Turkey were assessed[49]. Modelling for the potential in 2020 took into account economic potential (investment, running, capital costs), technical potential (with a technology development assumption) as well as the socio-political context (social acceptance, planning aspects, growth rate of industry and market distortions).

45 Presentation by Fatjon Tugu, Ministry of Economy, Trade and Energy: Investing in Energy Efficiency and Renewable Energy in the Energy Community, 18th March, 2010.

46 This project is strongly opposed by many Albanian civil society organisations due to its siting and export focus.

47 Presentation by Fatjon Tugu, Ministry of Economy, Trade and Energy: Renewable Energies Albania, at the Greening the Energy Community workshop in Vienna, 29-30 April 2009

48 This project also raises concerns as it appears that it may use palm oil (Presentation by Fatjon Tugu, Ministry of Economy, Trade and Energy: Investing in Energy Efficiency and Renewable Energy in the Energy Community, 18th March, 2010.) Palm oil is extremely controversial due to the environmental impacts of its production, and clearly does not use locally available resources. The project also appears to be at least partly export-oriented.

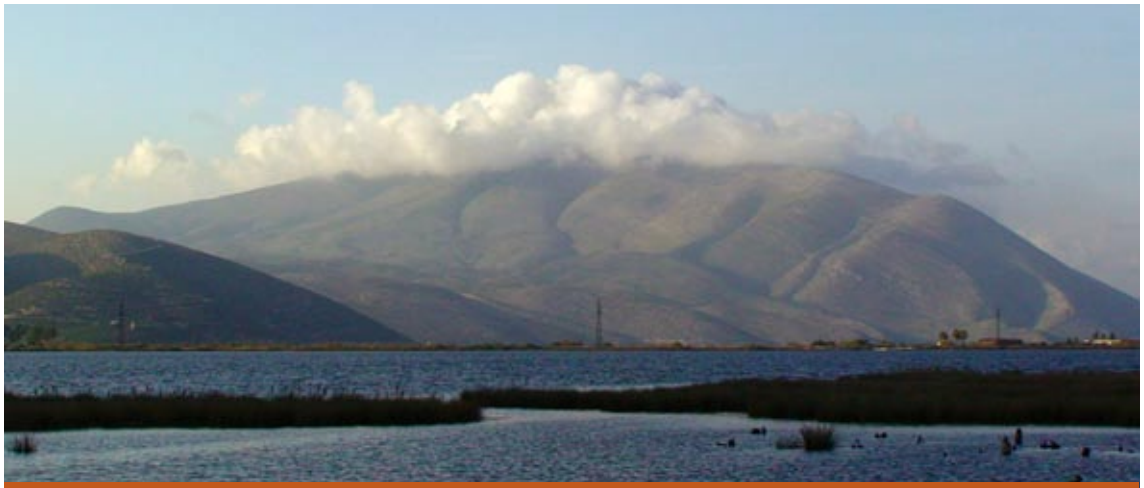
49 Report on RES-E potentials and costs for several major 35 European countries - GreenNet-Incentives, June 2009 (last update).

Table 6: Albania: Renewable electricity generation potential (TWh/year) according to GreenNet-Europe

	Achieved potential 2005	Additional potential / up to 2020
Biogas	0.06	0.84
(Solid) Biomass	0.00	0.55
Biowaste	0.00	0.12
Geothermal electricity	0.00	0.00
Hydro large-scale	4.13	5.15
Hydro small-scale	0.04	0.50
Photovoltaics	0.00	1.18
Solar thermal electricity	0.00	0.00
Tide and wave	0.00	0.17
Wind onshore	0.00	2.22
Wind offshore	0.00	0.68
Total	**4.73**	**11.41**

This model – although concentrating excessively on large hydropower considering Albania's need to diversify its energy resources and the serious environmental impacts of many large hydro plants – showed that by 2020 Albania could add (compared to the 2005 level) new electricity generation capacities of almost 3 TWh per year for onshore and offshore wind as well as 1.18 TWh per year for solar photovoltaics and 0.84 TWh per year for biogas.

There are Albanian sectoral studies indicating even bigger potential for the development of different kinds of renewables. For instance, an analysis by Xhelepi says that small HPPs will produce almost 1 TWh/ per year in 2025[50] – twice as much as in the GreenNet-Europe scenario. Another study on the "Assessment of Renewable Energy Sources Potentials in Albania" (part of a project funded by the Netherlands government) underlines the huge potential for producing electricity and heat in TPPs using co-generation technology, especially in co-generation heat and power plants fueled with biomass[51].



Karaburuni Peninsula, location of the future 500 MW wind farm promoted by the Italian Moncada Energy Group

50 S. Xhelepi, Use of energy from Small Hydro Power Plants in Albania, 2006, study in the framework of "Sustainable energy for Albania" project. CO-PLAN 2007. http://pdc.ceu.hu/archive/00003847/

51 Study on Assessment of RES Potentials in Albania, Co-PLAN, Institute for Habitat Development, 2007.

It is important to note that the potential figures from the GreenNet-Europe publication are not a forecast, but an indication of what can be achieved if existing barriers can be overcome and the driving forces encourage the development of renewables.

The current barriers take different shapes: technical barriers (e.g. the need for additional grid extension measures), market barriers (e.g. no stable planning horizon) or administrative barriers (e.g. the high bureaucracy burden for registering new installations). Removing barriers and giving incentives is the role of public authorities, so it is up to the Government of Albania to decide which path of development it will choose: either relying on resources that are plentifully available in Albania such as wind, sun and water, or locking Albania into long-term dependency on imported coal or oil.

The World Bank has recently conducted a cost-benefit analysis of possible answers to Albania's energy system vulnerability due to climate change[52]. A range of factors for the prioritisation of choices was taken into account. The report states: "Based on this analysis, the most economic options for Albania are to upgrade its existing LHPPs and SHPPs in the medium term, (...)".

This suggests that the priority for the Albanian government should not be the promotion of new capacities – even the building of new HPPs. Only in the long term does the study suggest new small HPPs and gas-fired TPPs.

Contrary to the NES, none of the studies mentioned above give a comprehensive picture of the energy sector's development including the costs of upgrading the electricity transmission system, but they show a significant potential for the development of energy efficiency and renewable energy.

A combination of planned wind power plants and existing – and hopefully rehabilitated – HPPs would make a suitable basis for the development of the Albanian electricity sector. The experience from the cooperation of electricity systems in Norway (dominated by HPPs) and Denmark (with a significant share of wind) has been successful: during windy weather cheap electricity from wind parks is sold to Norway, which provides Denmark with hydro energy when the wind turbines do not work. This scheme may be additionally supplemented by co-generation facilities fuelled with biomass[53], providing both electricity and heat for district heating.

So far the Albanian government has, apart from handing out concessions for small HPPs, not undertaken the necessary steps to promote renewable energies and energy efficiency measures. Where new renewable energy generation capacity is being added, it is too often focused on exporting to Italy. There are many reasons for the government's lack of progress in promoting energy efficiency and renewables, but it is clear that rather than actively pushing its own strategy forward, it has too often bent over to the whims of investors bringing projects like Porto Romano TPP, often without considering the environmental aspects and dependency on imported resources such as coal.

52 Climate Vulnerability Assessments. An Assessment of Climate Change Vulnerability, Risk, and Adaptation in Albania's Energy Sector, World Bank, November 2009.

53 Here we explicitly exclude municipal waste except organic waste, as municipal waste is predominantly composed of recyclable materials, mostly from non-renewable resources, for which burning is an extremely inefficient treatment.

7. Conclusions

It is clear that Albania needs investments into electricity generation, transmission and distribution in order to improve the current situation and to ensure security of electricity supply.

Albania's National Energy Strategy, although suffering from weaknesses such as over-dependence on hydropower and underestimating the potential of sustainable renewable energy sources, outlines a number of measures to be taken by 2020 in order to improve the situation. None of these envisages increasing Albania's reliance on coal, as the country does not have significant coal resources of its own.

Unfortunately, while the Albanian government has undertaken some measures envisaged in the strategy such as granting concessions for small HPPs, some of the new developments since 2006 when the strategy was updated have not closely followed the strategy: namely, a number of projects have appeared which primarily aim at exporting electricity to Italy rather than seriously addressing Albania's own electricity problems.

The Porto Romano TPP is the most notable of these projects, due to its enormity (1600 MW), its climate and pollution impacts, and the fact that it would use coal, which would need to be imported and would therefore not contribute to security of energy supply. While the project promoter Enel presents it as a project to increase Albania's energy security, that would also, by the way, export electricity to Italy, it has become clear at public hearings that 85 percent of the electricity produced would in fact be exported to Italy via an undersea cable.

A closer look at the NES and the developments since 2006 show that Albania is moving along with developing new capacity in the hydropower sector, even beyond what was envisaged in the strategy. While this may not be the wisest move in terms of both over-reliance on one source and environmental concerns, it is clear that the country is on track to make investments into new capacity that are equal to or even more than that foreseen in the NES. Investments are also progressing in the Albanian wind sector, although it is not clear how much of the planned output will be for Albanian consumption.

Even if it is deemed acceptable to build a project which is not in line with the NES – and one that would presumably slow its implementation – our study of the EIA for the Porto Romano TPP gives further cause for concern:

- The economic and social benefits that should be an essential component of development projects are almost completely left out of the EIA, except for some vague ideas about employment, which however do not state how many local people could be employed. Indeed, the construction of the the Porto Romano TPP may have negative impacts on long term employment opportunities because it hampers, to a certain extent, the development of more labour intensive industries such as renewable energies or energy efficiency services.
- Likely damaging effects on cultural monuments in the city of Durres are not assessed.
- The climate implications of the Porto Romano TPP are not assessed. The plant's very high CO_2 emissions, which will increase Albania's total emissions by more than 2.5 times, may impact on emission limits arising from Albania joining the EU and participating in the mechanisms of the post-Kyoto agreement.
- There is no sufficient study of the cumulative impact of several projects in the area, only a rapid assessment which does not state either the fuel or the capacity of the power plant. So far in Porto Romano, as well as the power plant, a terminal for the storage of petroleum products and gas is planned, along with a refinery and other industries.
- The zero option is not examined – namely what the implications are for the Albanian power sector if the plant is not built.

- There is no comparison of different alternatives except locations. No other technologies or other, cleaner fuels are considered.

Furthermore no information is available about the cost for Albania of the electricity from the plant , except that it would be sold at cost price. Without concrete figures this means nothing.

An examination of the climate implications of the project suggests that Enel's main interest in building the plant in Albania is the fact that it would have to pay for carbon credits if the plant was built in Italy. Depending on the reference price of carbon, building the plant in Albania instead of Italy would save Enel between EUR 232.5 to 325.5 million per year in 2020 – a clear case of carbon leakage.

The Albanian government must weigh up its options options more carefully. It is the role of the government to adjudicate between competing interests, to remove barriers and offer incentives according to what it is trying to achieve, and not simplysay yes to every investor that comes along for the sake of some cost-price electricity.

The Albanian government needs to decide which path of development it will choose.

We believe it should put serious effort into increasing energy efficiency and depending on the resources available in Albania such as wind, sun, biomass and water rather than opting to lock Albania into long-term dependency on imported coal or oil.

Italian energy giant Enel plans to construct a 2 x 800 MW coal-fired thermal power plant at Porto Romano near Durres in Albania. If constructed this would be the largest investment in the history of the Albanian energy sector, and would increase the country's CO_2 emissions more than 2.5 times from current levels. Yet 85 percent of the electricity produced would be exported to Italy. The advantages of the project for Enel are clear – much less clear, however, are what the benefits will be for Albania.

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