Renewable Energy Sources
From the international financial crisis to Greek reality

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December 2009
An overview of international financial developments and the impact thereof on investments in the energy sector
World crisis and the first measures taken

- **Financial Crisis Background:** The problems that emerged in the American subprime loan market in the summer of 2007 were the main cause for the breakout of the international crisis and brought the financial system on the verge of collapse. The real cause rests in the fact that for a period of over ten years we were part of a financial cycle whose three main characteristics were high levels of liquidity in world economy combined, however with overleveraging; at the same time audits and credit rating criteria were constantly becoming less tight. As a result, in September 2008, Lehman Brothers goes under and the crisis in the banking sector breaks out, since it is by then a fact that even the biggest investment banks may collapse. Within the upcoming months, the crisis expanded, as expected, to real economy, faced with a recession for the financial year 2009.

- **Measures Taken by Governments in support of the economy:** However, within this global crisis, governments took coordinated measures, for the first time, in order to support the economy:

  - **Significant falls in interest rates:** The mass reaction of central banks consisted primarily in the reduction of interest rates, which at present have been set at extraordinarily low levels in all major economies (1% for the Euro Zone, 0.25% for the USA and 0.5% for Britain). In addition, Central Banks provided high short-term liquidity to commercial banks.

  - **Provision of financial support packages to the banking system:** In addition all developed countries governments proceeded to the provision of strong financial support in order to save the financial system and stabilize world economy, hence practically displaying their intention not to let banks of important volume or significance for their national economies to collapse.

  - **Provision of financial support packages to real economy:** In parallel to the banking system support packages, most governments proceeded to the provision of support packages to the real economy, in order to stabilize financial activities in developed countries, while at the same time they supported continuous growth of developing countries.
Present financial situation and main challenges

- The big liquidity injections by central banks led to the recovery of the markets while steps were taken regarding stability at a global level. China was the leading participant in the recovery process.

- During the last months, the existing liquidity in the market was transferred to the credit markets as well as to stocks and commodities, a move explaining the recent activity in the international stock exchanges and the purchase of commodities. This activity could have a positive impact on the world economy, to the extent that an increase in stock prices would allow banks to restart their lending activities, but it could also create new “bubbles” of inestimable consequence to the present feeble recovery of the world’s economy.

- In the meantime, unemployment in Europe (9.8%) and in America (10.4%) is on a constant rise, a fact verifying how fragile the financial recovery is and justifying the insistence of central banks (ECB, FED) on the zero interest rate policy.

- In consequence, the crisis cannot be considered as a past and over with. It still remains a big challenge and a problem not only for central banks, economy specialists and investors, but also for real economy companies and medium and small enterprises, bearing the consequences of great uncertainty for global economy growth rate.

Brent Price (USD/BBL)

Estimates on the price of petrol for 2010 show great volatility within the year, with an average price of approximately USD 80/bbl (WTI) for 2010 in comparison to the average price of USD 59%/bbl estimated for 2009 and its 2008 price of USD 99/bbl.
The challenges in financing

- The financial crisis definitely influenced business financing, investment realization, the cost of borrowing and secondary terms, for the following reasons:

  - In 2009, reduced liquidity in the banking sector and the obligation to ensure capital adequacy made the provision of new loan capitals on behalf of the banks difficult. This trend represents the financial system rationalization in relation to the previous condition, whereby banks would grant loans not only based on the credibility of the borrower but also based on the placement of excess liquidity created through structured products (securitizations, derivatives etc.).

  - In parallel, as a result of the financial crisis, in the beginning of the year we witnessed a boom of business loan spreads. During the previous half, however, there had been a constant reduction of these spreads, which, combined with the low base interest rates, did not lead to further high borrowing cost issues for businesses.

  - In general, there is difficulty in financing (a) overleveraged companies or companies with strong refinancing needs (b) companies or investments at an early stage and therefore bearing a greater risk and (c) new investment projects with a long-term realization framework and a long-term repayment of the loan capitals.

  - In parallel, the credit worthiness assessment criteria have become more rigorous and following the crisis breakout, many international houses (S&P, Moody’s, Fitch) downgraded the credit standing of many companies, directly impacting thus on the cost of borrowing.

  - Thus, all the companies, large or smaller, were faced with issues related to liquidity, access to money as well as access to refinancing capitals for their existing loan capitals which need to be repaid due to maturity. Large companies partially solved the problem by resorting to capitals from the debt markets or the stock exchange. Indeed, in 2009 company bond issuing made a new record with utilities rising over €75 million in the period between January and September 2009 in comparison to the €41 bn for 2008.

  - Undoubtedly, the terms and conditions of borrowing remain particularly difficult for small and medium enterprises, since liquidity provisions to real economy through the banking system are still limited, due to the fact that the banks still have to deal with capital adequacy issues and maintain lower leverage indices. They are, therefore, focused on restructuring their budgets.
The energy sector around the world: General Remarks and Observations

- **Greater endurance in recession conditions:**
  - On a global scale the energy sector remains one of the most “enduring” and trustworthy sectors in recession conditions.
  - This has been verified by the high ability of European power utility companies to accumulate a significant number of capitals from the capital markets when they finally “opened up” again after the crisis, during the 2\textsuperscript{nd} half of 2009.

- **Investment limitation/postponement:** Although most European energy companies have managed to maintain the necessary liquidity in order to operate smoothly, they have become extremely cautious:
  - With regard to all types of new investments or development and expansion to new markets and new activities.
  - Most of them focused on the absolutely necessary capital expenses and postponed many of the investments they had initially included in their business loans.

- **Underperformance of Equity Indexes:** In addition, throughout 2009 power utility companies underperformed the equity indexes for the first time in the past years due to:
  - Low prices of electric energy, not expected to rise in the near future.
  - Decreased demand (and therefore decreased overcapacity in many areas).
  - Increasing oil prices and commodities within the last half of 2009.
  - Uncertainty as to the deficit of CO2 emission rights, especially after 2012.
  - Regulated invoices and how these may be influenced by the new reality following the crisis.
  - However, the Renewable Energy Sources sector is less sensitive to the aforementioned factors, while on the other hand certain investment incentives promoted by developed economies act in its favor (i.e. feed-in tariffs that ensure satisfactory IIR etc) thus still making it particularly attractive.
The international energy sector: General Remarks and Observations

- **Greater difficulty in ensuring financing**
  - To overleveraged companies or companies in the process of realizing specific large investments that need to be completed or in the process of embodying recent and significant takeovers.
  - To new and long-term large investments. Following the crisis, banks wish to lend for fewer years and require more securities while at the same time requiring a larger participation of equity investors. Alternatively the cost of borrowing becomes quite high.
  - In addition, financing becomes more difficult for companies exposed to external risks/ market risks (i.e. lower demand of electric energy, lower electricity prices, increasing oil cost etc.), such as independent electric energy producers or in general smaller companies of the sector.
  - For the aforementioned reasons and in order to ensure liquidity or improve their operating results and balance sheets, many energy sector companies have proceeded to or are in the process of asset disposal.

- The aforementioned new facts, deriving from the crisis, greatly influence the energy sector and it is certain that they will lead to a number of changes (mergers, takeovers, disinvestments) which most probably are not radical since all players are more apprehensive and are operating in a standby mode waiting for future developments.

- However, new investment opportunities will definitely arise, such as collaboration opportunities, and I believe that this is an optimistic message in the aftermath of the crisis, for all serious companies of the sector with a long-term strategy, whether small or larger ones.
The financial crisis clearly influenced the global renewable energy sources market as well as the investment realization times, which had reached the highest levels during the last years, but in comparison to other sectors or even the wider energy sector, the renewable energy sources have been less influenced for the aforementioned reasons.

With regards to the past, out of the approximately 20GW new power projects installed in 2008, the biggest part was related to wind energy projects (approximately 43%). In the end of 2008, the installed wind power was approximately 65GW, presenting a 15% increase in relation to 2007, while investments rose to €11bn in 2008 creating jobs for 160,000 employees.

International estimates for the growth of wind and photovoltaic power in particular are optimistic for the following years and therefore investment opportunities remain important, since green economy and the environment constitute the new financial growth model for the EU but also for most of the developed economies.
Global development and estimates regarding RES investments

Installed Wind Power Globally (GW)

Source: EPIA, Broker notes

Installed photovoltaic power globally (GW)
Greek RES Market Overview – Main Issues
Greece’s main goals for power

- Liberalization of electric power and natural gas according to the EU guidelines
- Achievement of EU Kyoto goals until 2012 so as greenhouse pollutants shall not exceed 25% in relation to the reference year.
- In parallel, achievement of the EU goals for climate change and sustainable development within the “20 – 20 -20” strategy framework; for Greece this means:
  - An 18% participation of renewable energy sources to the final consumption for the year 2020. According to estimates, this would require the implementation of 10,000 – 12,000 MW of Renewable Energy Sources, the larger part deriving from wind.
  - For sectors falling under the emissions trading section, limitation of their right to emission trading and measures against emissions through, for example, the implementation of energy saving technologies. In particular, as for industry and electricity production, it seems that as of 2013 there will be no free distribution of CO2 rights, significantly impacting on companies with a rights deficit, in the case of Greece, the Public Power Corporation, and consequently having a direct impact on the cost of produced energy for Greek consumers, since, at present, the PPC provides 90% of the market.
  - For companies not falling under the emissions trading sector, the emissions reduction percentage amounts to 4% in relation to the reference year 2005. These sectors are mainly related to the household and tertiary sector, transports and light industry.
  - For most of these sectors, Greece has adopted to this day a national action program for energy saving with specific measures based on other European developed countries standards. Not only is Greece’s specific energy consumption index one of the highest, but there has been a drop in energy efficiency during the last years with the construction and tertiary sector participating in the overall energy consumption with a higher percentage.
Main characteristics of the energy sector in Greece

<table>
<thead>
<tr>
<th>Reduced Demand following the crisis and ongoing investments</th>
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<tbody>
<tr>
<td>• Reduced demand as a result of the financial crisis (compared to the +1.2% increase of 2008): during the first 9 months of 2009, there has been an overall fall of -6%, with an overall decrease of -17% noted in industrial consumption while the reduction in households was only -2.5%. A short term demand recovery is not expected, however when recovery actually occurs, based on the facts and figures of today’s installed power, Greece’s reserve margin will be extremely low.</td>
</tr>
<tr>
<td>• With regard to new power, there are specific ongoing IPPs for the next 2-4 years. Energy sufficiency at a medium term timeframe will be assessed based on the demand, the realization speed of new IPPs as well as new RES projects together with demand recovery in comparison with the available power in the entire exporting SE zone.</td>
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<tr>
<th>Great dependency on lignite</th>
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<tr>
<td>• Great dependency on power generation from the local fuel, lignite.</td>
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<tr>
<td>• The Public Power Corporation owns and operates all lignite-fired power generation plants. It has announced a replacement program for old lignite units within the next five years.</td>
</tr>
<tr>
<td>• The great dependency on lignite production (approximately 52% for 2009) also entails financial consequences due to the obligation to purchase CO2 emissions rights and creates great uncertainty especially after 2012.</td>
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<thead>
<tr>
<th>CO2 Emissions</th>
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<tr>
<td>• In Greece, pricing is regulated and any future rise in pricing requires government approval, while for 2010, the state aims at zero rises.</td>
</tr>
<tr>
<td>• There is also a separation of competitive and monopolistic charges. Invoice charges for monopolizing are based on an annual performance of 8% on the capital employed for both transfer and distribution.</td>
</tr>
<tr>
<td>• The system’s marginal price has been reduced by almost 50% within 2009 compared to the previous years.</td>
</tr>
<tr>
<td>• The development of the system’s marginal price is heavily dependent on the natural gas price due to CCGTs in the interconnected network.</td>
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<table>
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<th>Regulated invoices</th>
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<tr>
<td>• Significant investment incentives e.g. feed-in-tariffs, subsidy opportunities etc.</td>
</tr>
<tr>
<td>• The main target is for RES to penetrate consumption by 18% until 2020.</td>
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<tr>
<td>• Presence of both big and smaller sector companies for the development of mainly wind and photovoltaic projects.</td>
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<th>System marginal value</th>
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<th>RES and target achievement</th>
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RES in power generation in Greece: General Remarks and Observations

- **RES in power generation in Greece**: For years now, RES have been attracting various types of investors from significant Greek and foreign industry players, to financial investors/investment capital and smaller domestic companies and investors.
  - The institutional framework in Greece offers significant incentives to RES investors.
  - Power generation from RES and its absorption in the system is a priority
  - There are feed in tariffs per specific RES category
  - The PPA with the operator is of a 10 year duration, with a renewal possibility for another 10 years following a request by the producer.
  - There is also a possibility for a subsidy of up to 40%

- Consequently, especially after the world financial crisis, most incentives are of great importance since they minimize investment risks and ensure satisfactory performances, while at the same time with regard to capacity level:
  - the productive capacity deficit in the field of electricity in the medium term is still a fact in Greece.
  - The EU is promoting RES development and has set ambitious goals for 2020.
  - Such types of investment give banks the opportunity to provide specific securities (e.g. assignment of the PPA to the Hellenic Transmission System Operator SA for electric power) and therefore to become more attractive since, not only do they significantly reduce the bank’s risk but they can also allow a higher leverage percentage.

- Notwithstanding these positive characteristics and the ambitious Greek government plan on RES, investments have delayed significantly and Greece has definitely been left behind in comparison to other European and Mediterranean countries (e.g. Spain, Italy and Portugal).

- Most investors today are in a stand-by mode, since they want to see whether the new government’s measures and actions will assess the problems on the appropriate basis, in a transparent and effective manner. This change should occur soon since valuable time has already been lost and the most trustworthy investors might end up withdrawing from the market.
## Electric power invoices produced by RES and High Efficiency Cogeneration

<table>
<thead>
<tr>
<th>Electric energy production from:</th>
<th>Energy Price (€/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interconnected System</td>
</tr>
<tr>
<td>(a) Wind Power</td>
<td>80,14</td>
</tr>
<tr>
<td>(b) Wind power from sea wind farms</td>
<td></td>
</tr>
<tr>
<td>(c) Water power exploited through small hydroelectric stations with an installed power of &lt; 15 MWe</td>
<td>80,14</td>
</tr>
<tr>
<td>(d) Solar power exploited through photovoltaic units with an installed power of &lt;= 100 kWpeak</td>
<td>457,14, 407,14</td>
</tr>
<tr>
<td>(e) Solar power exploited through photovoltaic units, with an installed power &gt;= 100 kWpeak</td>
<td></td>
</tr>
<tr>
<td>(f) Solar power exploited through technology units, other than photovoltaic, with an installed power &lt; 5 MWe</td>
<td>257,14, 237,14</td>
</tr>
<tr>
<td>(g) Solar power exploited through other technology units, other than the photovoltaic ones with an installed power &gt; 5 MWe</td>
<td></td>
</tr>
<tr>
<td>(h) Geothermic power, biomass, gases leaching from landfills and biological treatment plants and biogases</td>
<td>80,14</td>
</tr>
<tr>
<td>(i) Other RES</td>
<td>80,14</td>
</tr>
<tr>
<td>(j) High Efficiency Cogeneration</td>
<td>80,14</td>
</tr>
</tbody>
</table>
Overview of the wind power sector in Greece

General Information

- Greece still represents a very small part of global installed power deriving from wind systems (<1% and constantly reducing), notwithstanding the intense interest from both Greek investors and significant energy groups for investment in wind power projects as well as Greece’s large wind potential.

- Most financial analysts regard the wind power sector as the most promising sector in the field of energy on a global basis in the near future.

- During the past years in Greece, there has been growing interest for investments in wind power given a) the EU targets (20-20-20), b) Greece’s favorable regulating framework for investments in RES and c) the favorable climatic conditions. Large companies as well as smaller investors and investment capitals have developed activities in Greece. We will indicatively mention the names of some large foreign companies such as EDF Energies Nouvelles, Iberdrola, ENEL, Gamesa, Acciona, WPD, WRE etc.

- In 2008 the overall installed wind power was 1.015 MW (+36% compared to 2006 but only +162MW compared to 2007 and +104MW compared to 2006). These amounts are much less than the targets set, requiring more than 6.000MW wind power systems by 2020 and more than tripled installed power per year.

- So far numerous license requests have been deposited and although production licenses of a total power of approximately > 6,5 GW have been provided for wind farms, only a small part has reached an advanced level of investment completion (~1,9 GW either with an operating license or exclusively for an installment license).
Overview of the photovoltaic sector in Greece

GENERAL INFORMATION
- At a European level, this has been a rapidly growing sector, whose development depends highly on investment incentives provided by governments to investors. In addition, many analysts believe that development in this sector will derive from the implementation of photovoltaic systems in households.
- In Greece, it is one of the sectors attracting the majority of investors.
- In 2008, the installed photovoltaic power reached approximately 11MW, from 0.7MW in 2006.
- Large local and foreign companies have expressed interest as have many smaller scale investors.

FAVORABLE INSTITUTIONAL FRAMEWORK

AN AMBITIOUS PRIORITY
- The development of photovoltaic power still ranks among Greece’s first priorities. The initial framework was set with L.3468/06. Recently, this framework was completed with new laws, promoting among others, the installment of photovoltaic systems in buildings.
- The initial goal was the issuance of licenses of at least 700MW until 2010, to be fully operated by 2014. However, only a few of these projects have proceeded so far.
- The number of applications was unexpectedly large (>8,000), thus corresponding to an overall power significantly exceeding the initial target.
- Finally, the licensing system was satiated almost before its commencement. The Regulatory Authority for Energy approved licenses for approximately 420 MW in 2007 and
- PPA for 20 years
- High and guaranteed market price of the energy produced:
  - for February 2009 for mainland Greece it amounts to €400 - €450/MWh, while for the islands it is another €50/MWh extra,
  - indicative invoicing for the entire period of 20 years for projects >100KW and <100KW for interconnected and non connected systems (see following page).
- Investment subsidy of 40%
  - Exclusively for new applications over 2MW, no subsidies are envisaged.

only 150MW for 2008, while applications to the Authority for a license exemption as of October 2007 and a license as of April 2008 was decided.

Up until April 2008, the applications were formed as follows:

<table>
<thead>
<tr>
<th>Photovoltaic Cat.</th>
<th>Application No.</th>
<th>Power MWp</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;20 και &lt;150KWp</td>
<td>6.647</td>
<td>714,646</td>
</tr>
<tr>
<td>&gt;150 και &lt;2MWp</td>
<td>1.004</td>
<td>1,217,039</td>
</tr>
<tr>
<td>&gt;2MWp</td>
<td>296</td>
<td>1,824,900</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7,947</td>
<td>3,756,585</td>
</tr>
</tbody>
</table>
## Feed-in tariffs for photovoltaic and investment incentives

**Feed in Tariffs according to L. 3734/2009**

<table>
<thead>
<tr>
<th>Year –Month</th>
<th>INTERCONNECTED</th>
<th>NON CONNECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;100kW</td>
<td>&lt;100kW</td>
</tr>
<tr>
<td>February 2009</td>
<td>400,00</td>
<td>450,00</td>
</tr>
<tr>
<td>August 2009</td>
<td>400,00</td>
<td>450,00</td>
</tr>
<tr>
<td>February 2010</td>
<td>400,00</td>
<td>450,00</td>
</tr>
<tr>
<td>August 2010</td>
<td>392,04</td>
<td>441,05</td>
</tr>
<tr>
<td>February 2011</td>
<td>372,83</td>
<td>419,43</td>
</tr>
<tr>
<td>August 2011</td>
<td>351,01</td>
<td>394,88</td>
</tr>
<tr>
<td>February 2012</td>
<td>333,81</td>
<td>375,53</td>
</tr>
<tr>
<td>August 2012</td>
<td>314,27</td>
<td>353,56</td>
</tr>
<tr>
<td>February 2013</td>
<td>298,87</td>
<td>336,23</td>
</tr>
<tr>
<td>August 2013</td>
<td>281,38</td>
<td>316,55</td>
</tr>
<tr>
<td>February 2014</td>
<td>268,94</td>
<td>302,56</td>
</tr>
<tr>
<td>August 2014</td>
<td>260,97</td>
<td>293,59</td>
</tr>
</tbody>
</table>

Following 2015 for every year:

- $13 \chi \mu$ SMP (v-1)
- $14 \chi \mu$ SMP (v-1)

### Investment Incentives

- Subsidy or/and leasing subsidy
- Tax alleviation of up to 40%
- Subsidy of the cost of employment created through the investment of up to 40%
RES in Greece: Main problems to this day (1/2)

- A complex and unclear institutional framework especially in the laws and ministerial decrees/ circulars/ special clauses etc. that followed in order to amend the initial framework.
- Extremely complex licensing system causing great delays and vagueness as to the investment realization time frame due to:
  - the involvement of numerous bodies and services which in many cases do not have the necessary experience, personnel or infrastructure to process license applications.
  - vagueness and distortion as to the special planning required for RES (e.g. high productivity areas).
  - unjustifiable delays that commence even in the first licensing procedure stages
- Frequent reaction by local communities and appeals to the Council of State. Frequently, local society views negatively the perspective of a future RES installment in the area.
- Absence of a detailed and long-term National Plan for an optimized combination and RES penetration taking into consideration all technical, environmental, financial, social and strategic parameters as well as limitations (such as network saturation, long term cost etc).
- Deficit Energy Planning especially for the islands
  - For instance, the recent law on photovoltaic systems in buildings does not include non-connected islands and in particular big islands such as Crete, Rhodes, Corfu, under the pretext that the networks are saturated.
  - However many bodies argue that the islands should constitute one of the primary goals for the development of RES, for both large scale projects (in which case network upgrades would be necessary) as well as smaller scale projects, that through the use of intelligent applications or RES combinations will be able to meet different needs, in particular in small islands or isolated areas.
RES in Greece: Main problems to this day (2/2)

- **Insufficient infrastructures**: Additionally, in many cases, the infrastructure is insufficient, especially in regions with high wind power capacities. In any case, expansion and support of the existing networks is necessary in both mainland Greece and the islands. Naturally, we should not forget that the studies and the projects need to be financed by the Public Power Corporation, while the annual performance on capitals employed has been estimated to 8%.

- **Subsidies**: The current opportunity for subsidy applications did not have the expected results, while on the contrary it created misguided expectations and attracted investors aiming at short term profit.

- **In addition issues related to the annual RES invoices readjustments**

- **License trade**: Due to important incentives and the existing obstacles, the phenomenon of license reselling is currently observed (in many cases, even license applications have been resold), a fact causing further disturbances to a sound market development in the future.

- **Liquidity provided from the Hellenic Transmission System Operator (HTSO)** at a medium term in cases where there is a large deficit between the guaranteed price under which the HTSO purchases the electric power from RES producers and the marginal price of the compensated system

- **Minimal Benefits** for local societies at present. The government should also ensure clear benefits for the local society as well as guarantee reinforcement of local employment and regional development as much as possible.
Indicative proposals (page 1/3)

- Modifications and amendments to the existing legislation as well as rationalization of the necessary licensing procedure (effective time reduction for licensing, limitation of the opinion-giving bodies, strict compliance with deadlines accurate determination of the content of each opinion etc.). In addition reinforcement of the REA human resources in order to successfully fulfill its demanding tasks.

- Meetings with the participation of all scientific bodies, researchers, universities, NGOs, public bodies etc as well as market players, providing assistance and advice on both the institutional/licensing framework and the accurate implementation of the legislation, but also on the promotion of RES projects in the community.

- Improvement of the Special Planning Framework for RES, ensuring the optimal environmental licensing on transparent and clear terms, particularly with regard to the exclusion zones, as well as binding deadlines and precise opinion content for each body.

- To this direction, codification and publication of all the procedures on the internet and electronic monitoring of options, informing the party concerned on the progress of his/her application and the opinion giving procedure as well as all participating parties, in order to ensure higher levels of transparency.

- Updates and basic training on various issues to all bodies related to these investments, from government services and local bodies to banks and investors: technical, financial, commercial, technological, environmental etc. RES investments should not only be profitable for investors, transforming them thus into an exclusively commercial good, exclusively attracting investment capitals, they should above all be beneficial to society and the people, protect the environment, upgrade the quality of life and ensure a long term financial benefit for everyone.

- Limitation of the opportunity to resell licenses, by imposing limitations on license transferring.

- Rationalization of the pricing policy for each KWh produced for a different type of RES
Indicative proposals (page 2/3)

- Appropriate use of the Public Investments Program as well as of the available EU resources for the promotion of investments on clean technologies which will make an effective use of all the available forms of RES combined with energy saving, while emphasizing on innovation and new technologies and applications. To this effect, the subsidy program should also be readjusted.

- Creation of synergies and benefits for local communities:
  - Updates and constant dialogue with local communities, regarding the benefits deriving from particular investments in their region since the initial phase of the project.
  - The contributory fee will be given directly to the residents through electricity bills and not through the local authority.
  - To the extent possible, local bodies/investors should participate in companies share capital in medium scale projects, with a low rate.
  - In parallel, other relevant infrastructure works should be promoted in the region (electric network, road network etc.), as well as possible sponsorships related to energy saving from large investors to the local community possibly combined with government funding.
  - While the necessary upgrading of the local networks for RES projects takes place, a parallel effort should be made for their aesthetic upgrade, especially in tourist areas.

- The Public Power Corporation should work on a medium term plan for network upgrade allowing RES to smoothly penetrate the field in particular with regard to large penetration of wind power generation.

- Particular attention should be paid to islands facing the biggest problems but also presenting the highest growth capacities.

- Technical and financial studies, sustainability studies etc, as to the interconnection of islands as well as to the development of large offshore wind farms. Measures for the promotion of large scale RES installations in isolated or uninhabited regions i.e. islands/islets.
Finally, a long term, serious energy plan should be realized by the Government together with an action plan in order to develop the best RES combination according to the special characteristics of each region and aiming to maximize the benefits to society and the environment.

Within the aforementioned framework, alongside the promotion of large wind and photovoltaic systems, different criteria and investment incentives should be promoted in other RES categories and in general smaller scale RES projects should be given particular attention. For example, priority should be given to:

- Small scale RES (photovoltaic, biomass, geothermic) not requiring production license (in particular in islands or isolated systems)
- Hybrid systems in the islands and implementation of pilot programs such as the one of Ai Stratis, where the approximately 250 inhabitants’ electricity needs will be covered through hybrid systems. This project could be successfully implemented in bigger islands.

All the aforementioned plans for a National Action Plan for RES in Greece should also aim at strongly reinforcing employment and the country’s know-how. Consequently, it should provide additional motives for research and implement innovative technologies contributing to energy saving as well as to the best management and optimal performance of the resources in use.
RES project financing
The main sources of funding in Greece are 3

For photovoltaic systems the common funding scheme is usually as follows:
- 25% private individual
- 35% bank
- 40% subsidy

For wind systems, the funding scheme differs per case according to the investment size, the investor’s credit standing, the location, the respective possible funding, etc.

- Own Funds: These represent the investor’s participation in the investment with his/her own funds. The bigger these funds are, the better the investment will be assessed by banks since the loan’s settlement will be ensured by the project’s net operating cash flows. On the other hand, the bigger the investor’s participation, the lower the internal rate of return (IRR).
- Bank Loans: Bank loans may cover a great percentage of the entire investment. The percentage, the borrowing cost and the secondary terms depend on numerous factors, the most significant being: a) the investment’s total cost, b) the time frame for the project’s realization and operation, c) the loan’s duration, d) the investor’s credit standing together with his/her experience in similar projects, e) the existence of securities/collaterals which reduce the risks the bank is exposed to etc.


All investment projects provided for by the Law may receive the following incentives:
A) A state subsidy covering a percentage of the investment plan’s expenditure or/and a leasing subsidy by which the state covers the leasing installments for new mechanic and other equipment, or
B) Subsidy to pay the payroll cost incurred by the investment, or
C) Tax alleviations consisting in the exemption from the income tax for retained earnings during the first decade since the realization of the investment, through the creation of a tax-free reserve. As regards capital subsidy, the following stand for category 1, as provided for by the Law:

<table>
<thead>
<tr>
<th>Subsidy</th>
<th>Geographical Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Expenditure Coverage / Leasing Subsidy</td>
<td></td>
</tr>
<tr>
<td>A) 20%</td>
<td>B) 30%</td>
</tr>
<tr>
<td>C) 40%</td>
<td></td>
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</tbody>
</table>

**In addition, the investor’s own funds must be at least 25%, while 50% of the subsidy amount will be paid following the submission of a letter of guarantee and the remaining 50% will be paid following the completion of the project. The following table indicates the geographical zones.**

- NSRF: In addition, the NSRF program, pertaining to community resources management for the 4th CSF for public and private projects for 2007-2013 provides a subsidy of €2.8 bn for environmental and sustainable development out of a total of €31.9bn.
Geographical diversification according to the Investment Law

The country is divided in the following zones according to the Investment Law:
Regular structure of RES project financing in Greece to this day

- The investor is obliged to participate with his/her own funds in order to cover a percentage of the entire investment (25% according to the law in case the investor is considering applying for a state subsidy)
- In most cases, the investor is the one funding the investment e.g. the expenses related to licenses, a part or the total amount of the down payment for the equipment order etc.
- The investor usually requests a Bank loan after having received the production license and the Approval of Environmental Terms and either slightly before or following the installation approval.
- The loan percentage, the type of loan (senior debt, subordinated debt, bridge loan, etc) as well as the terms are modified on a case by case basis, with the exemption of photovoltaic systems, whereby a more standardized procedure is followed.
- The regular duration of a loan is 10 years, namely it is the same duration as the Hellenic Transmission System Operator SA; however, the loan may be issued with a smaller or longer duration.
- Other than the interest rate, there are some other fees the investor might need to pay to the Bank, related to the loan management and the necessary technical estimates. In the case of more complex financing structures, there are additional fees (arrangement fee, underwriting fee etc.).
- Finally, the provision of securities for risk diversification, such as the assignment of the sales and purchase agreement with the Hellenic Transmission System Operator S.A., securitization of the project’s assets, securitization of RES company shares, assignment of other contracts of the project etc. In addition the premises and the equipment need to be insured.
- In some cases, the banks offer single portfolio lending. This however is a more structured type of financing, not only regarding the project’s risk diversification (e.g. there might be a need for interest rate hedging for the duration of the loan through an IRD) but also regarding the fees to be charged.
- Capital subsidy according to the geographical zone and the investment’s extent may vary from 20% to 40%.
- The application for a subsidy is usually realized right after the investor receives the production license and the terms of connection.

Subsidies
- However, delays have mainly been noticed in the subsidy approval or reception, meaning that:
  - The investor is forced to pay the subsidy percentage from his/her own funds, even temporarily until reception of the subsidy.
  - Or he/she requires from the bank to subsidize the remaining percentage of the subsidy and is therefore asked to assign the bank the right to the subsidy (bridge finance).
  - In any case, this will increase the overall cost and ultimately modify the project’s IRR, while in
Main structure of a "project finance" structure

Main points in a project finance structure

- The project finance structure is mainly used for the financing of large infrastructure projects, including energy projects of a long duration (exceeding a time period of 10 years) for which own funds represent the smallest percentage of the overall cost.

- Such projects are normally held with the participation of one or more investors, while one or more banks may be participating in the financing.

- Loans are granted without or with a limited or non-source financing, while the loan’s repayment entirely depends on the estimated project profit at a particular time frame.

- Loans are also secured with the project's assets and the assignment of the project's main contracts.

- Borrowing companies will thus acquire rights on all the project's assets as well as the main contracts and should a problem occur they will have the right to undertake the project.

- Financing of such type is chosen for large investments on wind projects

Main diversification points compared to traditional loans

- In the case of Project Financing, loans are issued with limited or non-source financing against the project’s investor. On the contrary, in traditional loans this is normally a prerequisite for the banks in order to avoid any occurring problems e.g. due to incapacity to meet borrowing liabilities or alteration of the main features of the loan, they may require securities deriving from investor’s assets or company assets if the company participates in the capital (meaning assets not related to the project).

- In PF structures, the percentage of loan capitals related to own funds is usually higher as is the time frame for loan capitals repayment.
In general, banks in Greece have shown great interest in the RES sector, due to the specific incentives provided by the institutional framework and also because the loans they provide for these investments are secured. Hence, in the last years both Greek and foreign banks operating in Greece have commenced activities to this direction.

- We could say that many foreign banks are focused on big scale projects, since they do not have network connections or the personnel that Greek banks have to support application assessment and loan monitoring for smaller scale projects throughout Greece.
- For smaller investment, in particular with regard to photovoltaic systems, some banks have standardized the necessary documentation and terms, a fact that on the one hand simplifies and accelerates the procedure but does not however provide the best possible flexibility with regards to secondary terms according to each investment.
- In general, if the investor has already had a good collaboration with a bank, his/her credit standing will be assessed in a more positive manner.

In addition, at present, all banks have realized the problems of the RES market as well as the uncertainties and risks possibly arising and are waiting for significant changes that might lead to redefinition of their strategy. The main issues concerning banks are the same issues puzzling investors:

- Unclear timeframe of project realization either due to licensing problems or due to network and connection issues.
- Uncertainty as to subsidies, as well as swelling uncertainty as to the Hellenic Transmission System Operator SA ability to timely meet its obligations vis-à-vis RES producers.
- All remaining risks related to RES development are comprehensible and may be assessed and managed accordingly by the banks.
- In addition, as a result of the financial crisis, banks have become more selective and cautious as to the investment they grant capitals to; funds are not as available as they used to in the past.
Conclusions
Conclusions

At present we are going through a period of economic crisis but also a period requiring urgent measures against climate changes. A broader use of RES is the main requirement for an optimal solution to today's energy problems, combined with appropriate management and energy saving. Only in this way will we achieve our goals for green development revolving around the three main pillars ECONOMY – SOCIETY – ENVIRONMENT.

In consequence, in order to achieve our main goals we need to implement targeted measures and regulations:

- A long-term and serious energy and spatial planning.
- Right use of the Public Investment Program and EU resources available in order to promote investments in clear technologies; making efficient use of all RES sources available in combination with energy saving placing emphasis on innovation and new technologies and applications.
- Effective use of all bodies participating in opinion-giving procedures e.g. competent ministries concerned, the Technical Chamber of Greece and other scientific bodies and chambers, NGO’s, local bodies etc.
- Development process needs to involve many stakeholders and in particular new and specialized individuals, as well as SMEs and become the main tool towards an equilibrated, sustainable regional development.