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THE FEED-IN PREMIUM AS A RES SUPPORT SCHEME **OR** FEED-IN TARIFF VS. FEED-IN PREMIUM: AN ANALYSIS

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Introduction

- The most widely spread means of accelerating investments in Renewable Energy Sources (RES) is the use of feed-in tariffs (FITs). The U.S.A. enacted the first FIT policy in 1978, with Germany following suit in 1990.
- Currently, the two most common FIT policies are the **fixed FIT** and the **feed-in premium**, which can be respectively considered to be **independent** of or **dependent** on the market price for electricity, as such derives by the market structure (ex. mandatory pool).
- The fixed FIT is the most widely used FIT design; however, the feed-in premium is being increasingly utilized (ex. in Spain, the Czech Republic, Estonia, Slovenia, the Netherlands, Denmark [for onshore wind] and Italy [for photovoltaics]).

Introduction (text for Gus)

- The genesis of this presentation is found in the obligations which Greece has undertaken – in compliance with the commitments taken under the recent loan agreements with the EU and the IMF – to review its existing FIT support scheme in order to make it more compatible with market developments and to reduce pressures on public finances. [In other words, because the FITs provided for in Greece are considered, at least for some technologies, high, Greece's lenders have shown a concern and a desire to limit the countries financial exposure].
- Therefore, in this presentation we shall look at the different FIT structures, briefly discuss some of the problems which the Greek electricity market faces, and consider whether the current FIT scheme (in this case, the fixed FIT) performs as desired, or whether it should be altered some or changed altogether.

Fixed FIT

- **Characteristics of the fixed FIT structure:**
 - Payment level remains independent from the market price, offering a guaranteed payment for a specific period of time.
 - Higher level of cost efficiency, due to lower investor risk and higher transparency.
 - Can promote different goals on the basis of various considerations, such as:
 - Type of technology (wind, solar, biomass etc.),
 - Size of the project (over or under a certain capacity),
 - Location of the project (onshore/offshore, interconnected/non-interconnected system).

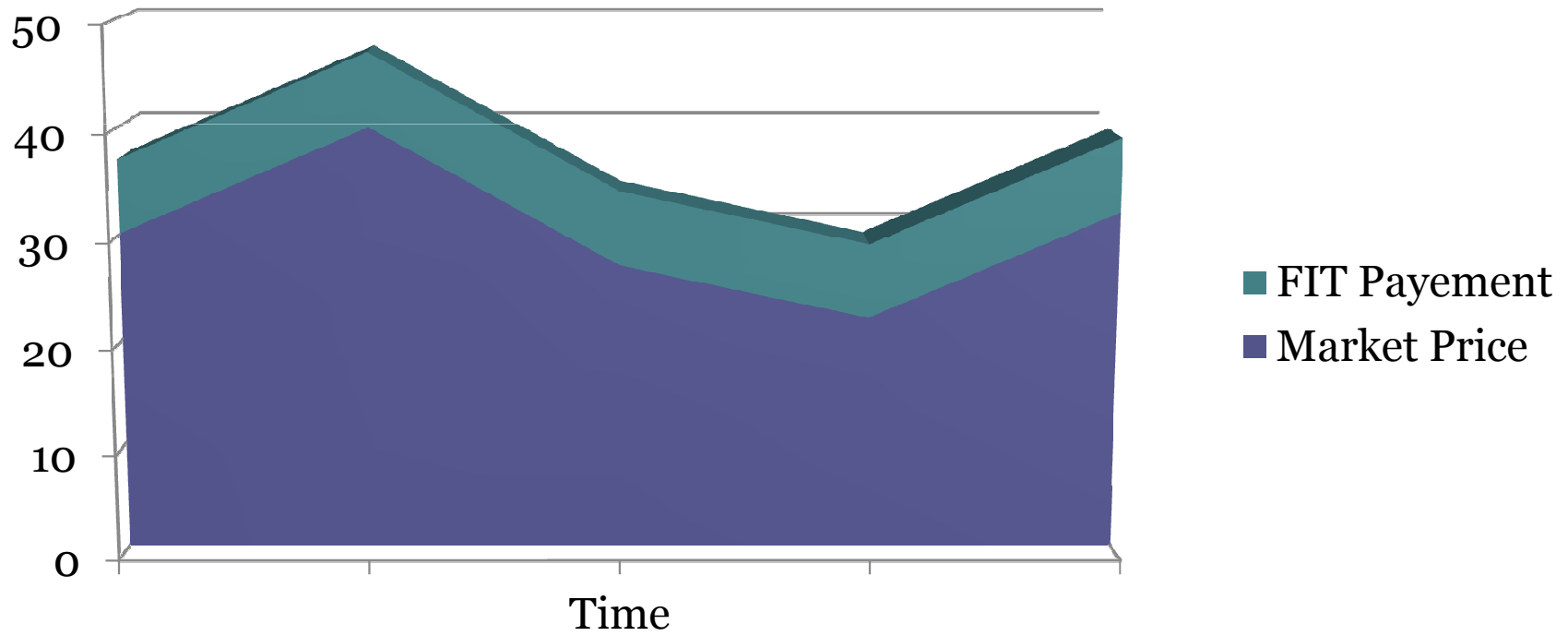
Feed-in Premium

- Characteristics of a typical feed-in premium structure:
 - Payment level is based on a premium offered above the market price for electricity; this premium can either be **constant**, or it can vary based on a **sliding** scale.
 - Developers can enjoy high rewards when market prices increase, but also run a corresponding risk when they decrease; in order to avoid a large divergence between profits and losses, it can be designed with payment **caps** and/or **floors**.

Constant vs. Sliding Feed-in Premium

Constant Feed-in Premium (market price + fixed premium)	Sliding Feed-in Premium (the higher the market price, the lower the premium)
<p>High market price → high payment levels [=higher societal costs]</p>	<p>The risk of overcompensation is decreased.</p>
<p>Low market price → low payment levels [=risks on project profitability]</p>	<p>The introduction of caps and floors can minimize both the upside and the downside risks → greater certainty for the State's FIT costs and for the investor's profits.</p>
<p>The level of the premium is independent from the market price.</p>	
<p>The prospect of high payments when the market price is high can be viewed as compensation for the risk of having a low market price.</p>	<p>Requires the design of a complex model, in order to ensure that the volatility of market prices does not cause large fluctuations in RES investments.</p>

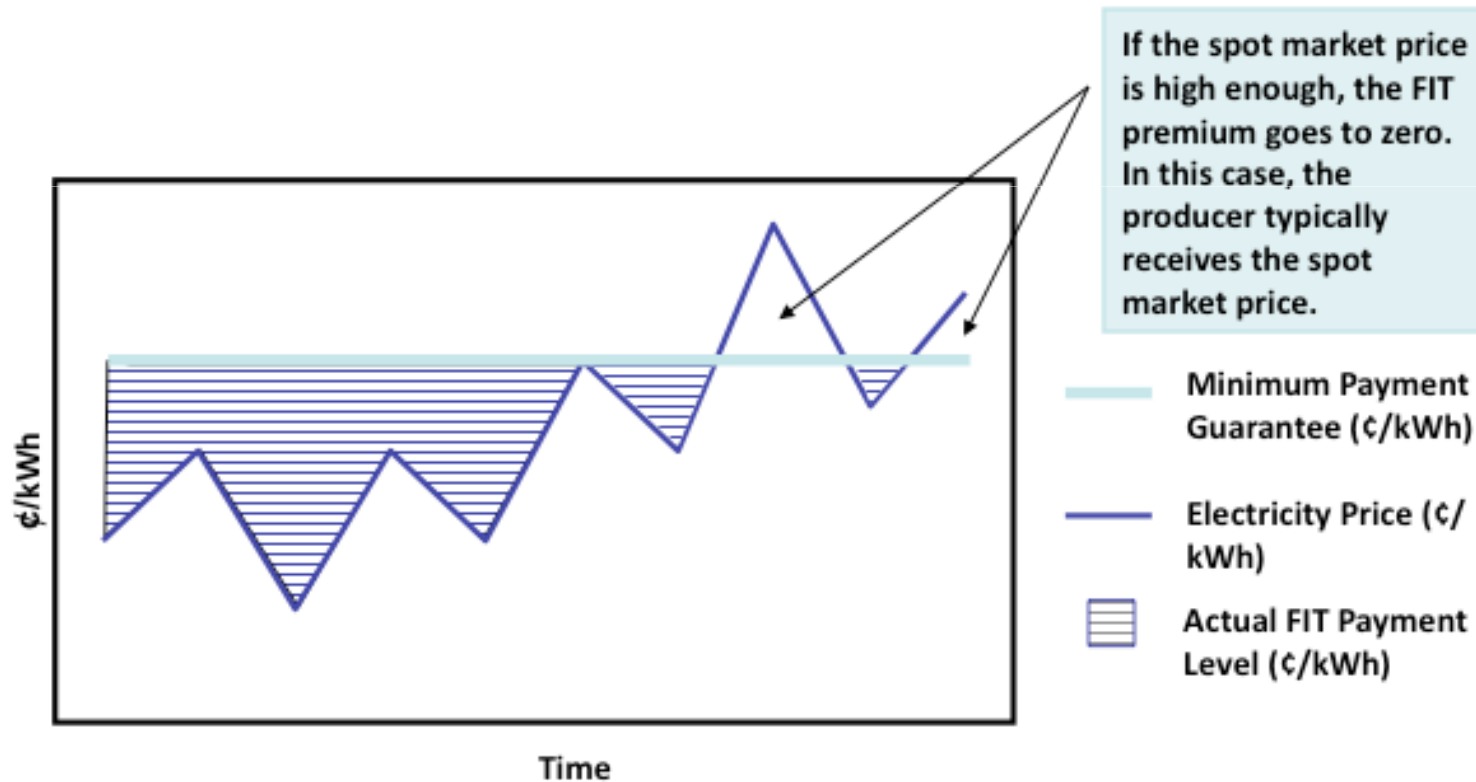
Constant Feed-in Premium Model



Constant Feed-in Premium Model (text for Gus)

- This constant feed-in premium model offers a set premium above the average market price. In this model the premium is fixed, but the total payment received by the producer is dependent on the market price.
- This is in contrast to the fixed FIT, where payments are independent of market prices, and where a purchase guarantee is typically included, which in turn keeps RES production separate from spot market dynamics.

Sliding Feed-in Premium with a guaranteed minimum payment



Sliding Feed-in Premium with a guaranteed minimum payment (text for Gus)

- Here we see a sliding feed-in premium model which offers a guaranteed minimum payment. In this respect, it is similar to the fixed FIT and provides revenue certainty for developers and investors.
- However, instead of the FIT payment covering the total amount, the sliding FIT payment only covers the difference between the guaranteed minimum and the average market price.
- This means that the *premium payment* varies based on the price of electricity.

FIT Model	Advantages	Disadvantages
Fixed FIT	<ul style="list-style-type: none"> • Lower average per-kWh costs for the State. • Higher transparency and stability of payment levels reduces investor risk and encourages infant technologies. • Payments are more closely related to actual costs of RES generation. 	<ul style="list-style-type: none"> • Lower average per-kWh cost benefits for the producer. • Is costly over time, esp. when the FIT is adjusted for inflation. • No incentive to develop RES in areas where mostly needed. • No incentive to adjust supply to demand.
Feed-in Premium	<ul style="list-style-type: none"> • Higher average per-kWh cost benefits for the producer. • More compatible with liberalized electricity markets. • Supply more likely to adjust to demand. 	<ul style="list-style-type: none"> • Higher average per-kWh costs for the State. • Greater investor risks, with no purchase guarantee and the inability to utilize the hedge value of a fixed FIT.

Advantages and Disadvantages Table (notes for Gus)

- **FYI:** The third and fourth bullets in the Fixed FIT disadvantages relate mainly to markets without a mandatory pool structure, and therefore are not yet applicable to Greece.
- The same goes for the third bullet in the Feed-in Premium advantages.

The Greek example

- Greece has had a long history of using FITs in order to promote RES production. It's efforts date back to 1994, as Greece was one of the first ten countries globally to institute a FIT mechanism.
- In *1994*, Greece introduced **fixed FITs** for electricity produced with the use of RES, while it obliged the incumbent electricity utility to purchase – by priority – the power produced from RES power plants.

A brief history

- Several legislative efforts (in *1999*, *2006*, *2009*, *2010*, and *2011*) furthered and adjusted the FIT scheme, but they all maintained the structure of the fixed FIT. However, in order to make the fixed FIT scheme more responsive to market conditions, Greece has adopted a regular FITs decrease mechanism for PVs and has, at times, issued ad hoc decisions altering the FITs for other forms of RES generation.

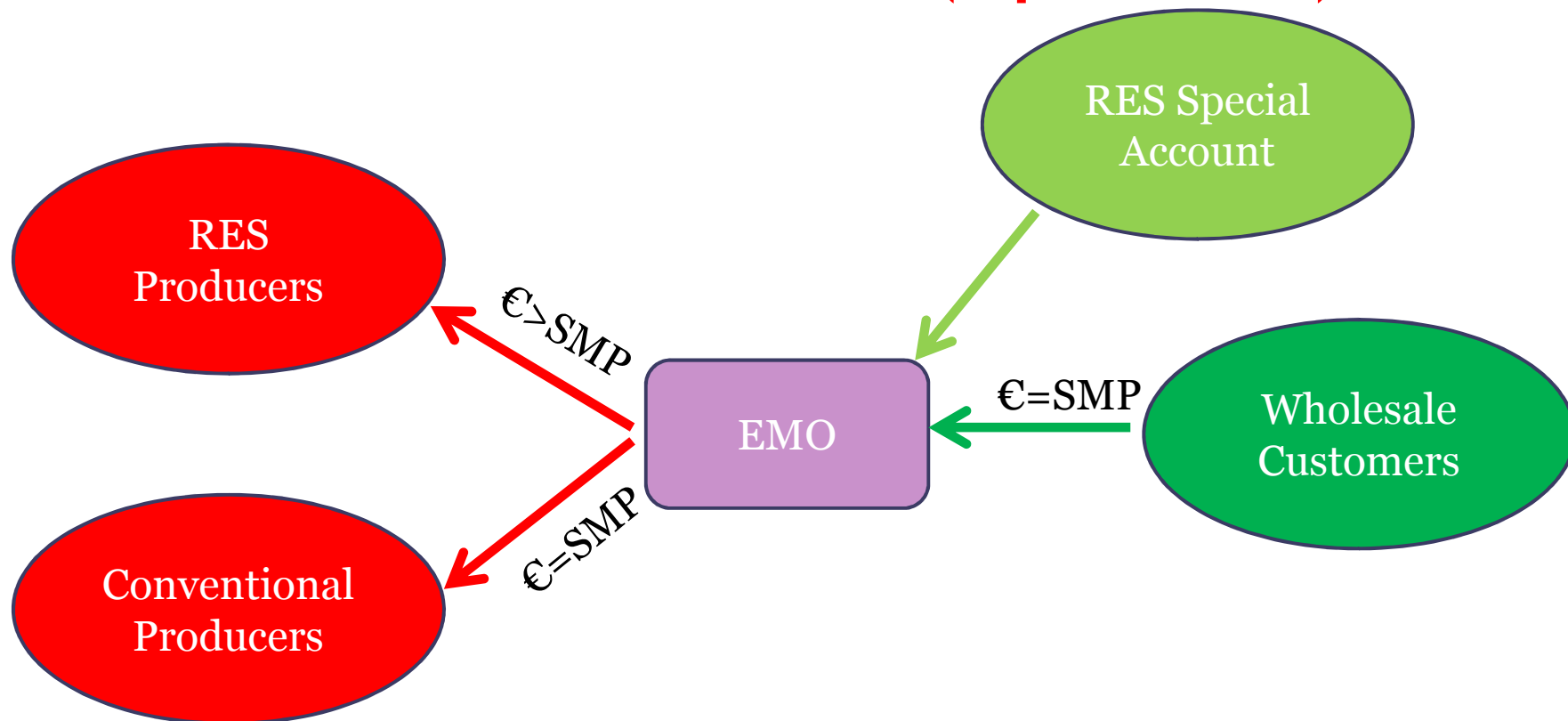
The FIT review plan

- In *2012* the Greek Parliament, under its loan commitments and in coordination with its European partners and the IMF, undertook the obligation to comprehensively review the existing FIT structure and set out a number of alternatives by preparing a plan for the reform of the RES support schemes to make them more compatible with market developments and to reduce the pressures on public finances.
- This plan *must include* options for the reform of the FIT support scheme, including the option of a **feed-in premium** model. The singling out of the feed-in premium model indicates the importance given to it, as it has gained momentum in recent years and has been adopted by an increasing number of countries.

The Greek FIT “problem” (optional)

- Currently, Greece faces an issue referred to as “the EMO deficit”. This deficit is responsible for the delayed payment of power producers, and has caused a ripple effect throughout the energy sector, further amplified by the current economic crisis.
- It has been argued that adopting the feed-in premium model could help alleviate part of this deficit by structurally changing the FIT scheme.

The EMO deficit (optional)



The EMO deficit (text for Gus)

- The EMO is supposed to be a “payments facilitator”: it buys electricity from producers and sells electricity to wholesale customers at the same System Marginal Price (SMP) with no profit from this activity.
- For electricity produced by RES power plants the EMO buys electricity **by priority** at the fixed FIT prices. When these prices are higher than the SMP, the purchase price paid by the EMO is higher than the sales prices received from the wholesale customers (the SMP). This creates a deficit for the EMO .
- For this reason, a **RES Special Account** was enacted to ensure that this deficit will be fully recovered.

The EMO deficit (text for Gus)

- This RES Special Account has several sources of funding, some already utilized and some still dormant, which are:
 - Imbalance and Day Ahead Scheduling Payments
 - Non-Interconnected Island Supplier Fees
 - CO₂ Emission Rights Auction Income
 - Warranties and/or Penalties
 - Public TV License Fee
 - Special RES Duty
 - Lignite Duty

The EMO deficit (text for Gus)

- However, the funds of the RES Special Account are not sufficient to cover this EMO deficit, which therefore is steadily increasing; therefore, instead of adding new sources to the RES Special Account (“band-aids”), the FIT review plan aims to solve this problem by structurally changing the FIT scheme.

The EMO deficit (optional)

- In 2011, the average System Marginal Price (SMP) for electricity was approximately 74€/MWh, while the average purchase price paid by the EMO to RES producers was approximately 150€/MWh.
- The reason for this large divergence is two-fold:
 - RES production is afforded a high FIT, especially for photovoltaics which have had a high level of penetration in the Greek market.
 - The SMP does not always reflect the actual generation costs, remaining artificially low.

The FIT review plan conclusions

- The Ministry of Environment, Energy and Climate Change, in the plan for the reform of the RES support scheme, reviewed the feed-in premium option and concluded that, at least at the present time, it is not appropriate for the Greek market.
- Additionally, it found that the present fixed FIT scheme, along with the predetermined semi-annual decrease of the PV FITs, have been successful in their goals, which include the increase of RES penetration and the responsiveness of the value of the FIT to the cost of RES energy generation.

The FIT review plan conclusions

- The reasons which the Ministry put forth are:
 - The current financial climate requires stability which does not exist in the feed-in premium models.
 - The feed-in premium model performs best in a market where energy storage and the scheduling of RES production is possible.
 - The wholesale electricity market lacks an overall long-term structural plan. It is also divided, with the existence of autonomous systems on the non-interconnected islands.
 - Connecting the FIT to the SMP could possibly cause further distortions in the market.
 - Ad hoc changes to the current fixed FIT scheme are made in order to ease the problems of the energy market (ex. the EMO deficit).

The FIT review plan conclusions (text for Gus)

- The reasons which the Ministry put forth are:
 - In order to promote investments in the current financial climate, it is necessary to have as stable of a payment structure for investors as possible; this stability does not exist in the feed-in premium models.
 - The feed-in premium model is best utilized in a market where energy storage – and therefore the scheduling of RES production – is possible. In Greece, because RES production is based mainly on wind and solar power generation and is injected by priority to the system, the benefits of the feed-in premium would not be realized.

The FIT review plan conclusions (text for Gus)

- The reasons which the Ministry put forth are:
 - The wholesale electricity market is still under reform (it still operates under the transitional provisions of the Code). As such, the challenge of designing a feed-in premium scheme that would bring about the desired results is that much greater. This is further complicated by the fact that the non-interconnected islands currently are not part of the wholesale market scheme.
 - The SMP, as currently calculated, remains at artificially low levels. Therefore, connecting the value of the FIT to the SMP would not cure and could possibly cause further distortions in the market.
 - Changes have already been made (ex. the reduction of PV FITs), and other – structural changes – are planned for the current fixed FIT scheme in order to improve it, and to ease the problems of the energy market (ex. the EMO deficit).

Closing Remarks

- The Greek government continues to fully support the feed-in mechanism as the most suitable way to effectively and efficiently promote renewable energies.
- The use of the fixed FIT, while imperfect in its application, continues to be viewed as preferable over the feed-in premium, at least in the current economic climate, where stability is the key requirement for interments in Greece.

Closing Remarks

- As the Ministry begins to implement more structural changes in the tariff scheme, it shall become clearer whether the fixed FIT will remain the most suitable scheme for Greece, or whether – in connection with increased transparency in the market and the restructuring of the wholesale energy market – the possibility of using the feed-in premium should be revisited.



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