

**TACKLING BOOM AND BUST IN
THE RENEWABLE ENERGY SECTOR:
THE CASE OF BULGARIA**

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Submitted to
Central European University
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in partial fulfillment for the degree of Master of Arts in Public Policy

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Budapest, Hungary

2013

Abstract

The renewable energy policy is in the avant-garde of the global transition to a sustainable energy system. This research paper uses the case of Bulgaria's renewable energy sector to explore the shades between policy success and policy failure. Due to generous incentives, in about three years the total capacity of solar PV installations in this country expanded from nearly-zero to over 1 GW, creating significant financial problems for grid companies, households and the government. I examine this RES market bubble, using the analytical framework developed by Marsh and McConnell (2010) and McConnell (2010). The framework defines success on three levels: *process*, *program* and *politics*. As a contribution to the policy literature, I propose a new category in the spectrum of success to failure – *bitter non-failure* – i.e. when in some dimensions success is evident, yet restricted, and in others the perception of failure prevails. In terms of the Bulgarian case, the main recommendation is connected to the implementation of more flexible pricing scheme, which allows for better cost-efficiency. Currently, the discussion revolves around adoption of market mechanisms such as green certificates or modification of the feed-in tariffs.

Keywords: Renewable energy policy, Policy success, Policy failure, Bulgarian energy sector

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Introduction

Renewable energy sources (RES) play a major role in transforming the global energy system from one characterized by finite and polluting sources to another which ideally should feature economic and environmental sustainability. Often seen either as a game-changer in energy or just an exotic addition to conventional sources, RES face many practical barriers in terms of competitiveness, deployment, political and social perceptions. In policy science terms, renewables (commonly referred to as green energy) are stuck in a market failure situation, which favors conventional energy sources due to markets' inability to take into account all their negative externalities.

In order to overcome these challenges, the European Union initiated large-scale support for energy production and consumption from RES, ultimately aiming at diversified energy mix and lower environmental impact of its member states. In March 2007 EU leaders embarked on a pathway to global environmental leadership, with a set of climate-friendly and energy goals to be achieved by 2020 – a 20% decrease in the EU greenhouse gas emissions (GHG) against levels in 1990; a 20% share of RES in the final energy consumption (electricity, heating and cooling); and a 20% cut in the EU primary energy consumption through better efficiency (European Commission 2011, 2012). Latest available figures show that already in 2011 installations running on RES provided 13.4% of EU total energy consumption, a notable increase from 8.5% share in 2005 (EurObserv'ER 2013, European Commission 2013b). Though often perceived as burdensome, latest quantitative research argues that RES are economically beneficial and it makes sense to support them through public funds. At least in Europe, net benefits from providing feed-in tariffs (FiT) and other subsidies to electricity generation from renewables turn out to be larger than expected due to rising energy costs

occurring in periods with high oil prices (Krozer 2013).

According to some studies (Blesl et al. 2010), the rapid development of this sector was largely due to policy goals and frameworks (which imply more active support) rather than to technology factors themselves. On a global scale, however, financial support for green energy remains much lower compared to what is provided for fossil fuels. For example, in 2010 the world subsidized RES by \$ 66 billion, around 6 times less money than the sum provided in support of fossil fuels (International Energy Agency 2011, World Nuclear Association 2013).

In some European countries, however, preferences and favorable investment conditions – established mainly through the EU 2009 directive on renewables¹ – have already proven to be too tempting. As a result, market bubbles on the supply side were inflated within a few years. Spain, probably the most notable case, now ranks among top EU countries in terms of total capacity of wind and solar photovoltaics (PV) projects and gets more than half of its electricity from renewables. All this came at the expense of electric utilities. Acting as intermediaries, they were legally obliged to provide generous payments to green energy producers but (also legally) could not recover these funds from end-consumers (Couture and Bechberger 2013, Kelly-Detwiler 2013). Now the accumulated discrepancy between spending on green electricity and revenues stands at 25.5 billion euro (ibid.). In response, a series of policy measures – including retroactive tax on electricity generation – were introduced by the Spanish government, yet the problem remains. The emerging uncertainty could close the door for new projects. In short, the boom created financial calamities for grid operators and the government and, ultimately, resulted in gloomy perspectives for the sector

¹ Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

(though at least grid management issues related to RES fluctuations seem settled).

Perplexed policy outcomes like the ones described above make evaluations and further interventions very problematic. Before new actions are taken, a space for policy learning should be open. What constitutes a successful renewable energy program, and what turns it into a failure? This remains a policy puzzle insufficiently explored by the research community.

Using insights from the literature on policy evaluation – in the spectrum from success to failure, this research paper looks at another European case of renewable energy boom and bust which, however, stems from different political setting and features distinct policy response. Starting from scratch, from 2008/09 to 2012 Bulgaria exponentially developed its solar PV power. In the second half of 2012, solar PVs reached around 1 GW of installed capacity from the total of 13.8 GW of all power plants in the country (European Commission 2013a: 3, 7). Most PV projects came online in the first half of 2012. The roll-out of wind farms followed a far less steep growth path. The growing financial deficit, similar to the one in the Spanish energy system, could no longer be suppressed by the government. The Bulgarian energy regulatory commission increased by 13% on average the electricity prices for end-consumers reflecting the increasing generation of still expensive green energy. This was a price hike unseen in previous years and, understandably, it fueled massive social discontent. At the same time, however, Bulgaria is confidently approaching its national 2020 target under the EU legislation, which is 16% share of RES in the final energy consumption. Already in 2011, i.e. before the big PV boom, the share expanded to 13.8% (Eurostat 2013). So is Bulgaria's renewable energy policy a success, a failure or somewhere in between?

In order to build well-substantiated answer, I examine the RES market bubble in Bulgaria, relying largely on the three dimensions of policy success and failure developed by Marsh and McConnell (2010) and McConnell (2010). The dimensions are *process* (step-by-step crafting and implementation of policies), *program* (concrete, often technical and operational measures towards specified goals) and *politics* (the broader social and partisan attitudes). Dynamics in the solar PV segment are the focus of this research, leaving aside other types of projects like wind and biomass installations.

The study strives to enrich available interpretations of success and failure, contributing to the ongoing critical dialogue on policy evaluation. Furthermore, with regard to policy learning, the paper presents practical recommendations for tackling boom and bust situations like the one in Bulgaria.

In methodological terms, primary data were collected from legal documents on national and EU level as well as from industry publications. As a way to strengthen the empirical focus of the study, in April and May 2013 I conducted four semi-structured interviews with Bulgarian energy experts. Theory-based insights and secondary data were derived from scholarly literature, publications by domestic and international organizations, industry statistics, and media reports.

Applying qualitative inquiry, the paper proceeds as follows. In order to carve out the research gap more thoroughly, the first chapter reviews: a) existing literature on policy evaluation; b) administrative and market-based support schemes for renewable energy; and c) works on the energy sector in CEE and Bulgaria. The second chapter provides justification on the case selection, contrasting Bulgaria's energy sector to those in Greece and Romania. The same

section builds the analytical framework along the *process-program-politics* division. In the third chapter I discuss the Bulgarian case with background and more details (using the interviews) in order to apply it against the framework from Chapter 2. Recommendations and final remarks conclude the paper, pointing to areas of further research.

Chapter 1: Literature review

Starting with a review of several prominent writings, this chapter makes the case for policy evaluation as a middle-ground between goal-oriented ('objective') and value-based ('subjective') assessments which are needed for policy learning and improved policy implementation. Furthermore, pointing to the need for incentives for renewable energy, the chapter will discuss the two main categories of support schemes: administrative and market-oriented ones. A short presentation on what analyses are available on RES in Central and Eastern Europe and in Bulgaria in particular concludes this chapter.

1.1. Policy evaluation – policy learning, utilization and categories of evaluation

In this section I discuss policy evaluation with regard to three important aspects: policy learning, utilization, and categorization of evaluation research.

In terms of the classic policy cycle model, the policy evaluation phase should present merits and faults of a program or course of action. As Vedung puts it, evaluation means “distinguishing the worthwhile from the pointless, the precious from the worthless” (2006: 397). In more technical terms, evaluation is also understood as planning, monitoring and assessment of outcome indicators – both technical and institutional ones (Neij and Åstrand 2006). These indicators should be set against predetermined goals. Sanderson succinctly points that “If policy is goal-driven, evaluation should be goal-oriented” (2000: 438). At least in theory, goals and expectations in policy-making, i.e. 'what do we want to achieve', should be linked by proper policy design (Howlett 2009), which, in turn, delimits the possible policy instruments, i.e. 'how do we intend to achieve it'. Without adequate assessment of available

resources and concrete options policies may be destined to fail (ibid.). However, Vedung stresses that the role of goals might be purposefully exaggerated, because they are usually “set not only to be achieved but to garner support from various audiences” and hence “goals are not good value criteria for performance and achievement” (Vedung 2006: 401).

The whole process chain – from goals to instruments – is embedded in a larger framework which Howlett calls the governance mode. In the case of renewables, the EU and its environmental commitment represent this broader policy arena in which concrete goals (e.g. the 20-20-20 targets) and means (e.g. subsidies) emerge. According to Howlett, this context or governance mode depends on the preferences and values which dominate in society. In most Western European countries, for instance, the preference today could be for a mode which supports the market economy but which is also aware of externalities induced to the environment.

In a market-oriented system the state has the duty not only to promote free and open competition, but also to correct for market failures, i.e. when externalities are not factored in and policy results are suboptimal. Such is the case with RES, which are harnessed through currently more expensive technologies compared to fossil fuels. The latter produce a lot more negative externalities – environmental degradation and public health problems – which in purely market conditions were ignored. Active RES policy should make green energy more competitive through subsidies but also through exposing fossil fuels' real price. However, as Howlett argues, “There is not a 1:1 correspondence between failure and corrective tools and, typically, many instruments could conceivably address a problem” (2009: 80). Closing the feedback circuit of the policy cycle (Sabatier 1988, Sanderson 2000), evaluation results should lead to *policy learning* which, in turn, should ideally inform and improve existing

policies or substantiate the creation of new ones.

One important aspect of policy learning is that opposing camps in policy negotiations would be prone to reject information running against their core beliefs (values) while cherry-picking those bits and pieces which could be aligned with their stance (Sabatier 1988). Ultimately, no decision can be perfect no matter what the balance of power in real-world conditions is, yet “... it is more important to make learning processes possible than to make the best decision in advance” (Kaufmann 1986: 224 as cited in Sanderson 2000: 445). Indeed, this is how policy evaluation adds value in the policy process. However, Sabatier goes further to note that even though policy learning is a powerful phenomenon, changes in negotiations could occur as a side effect of external variables such as economic or political shocks.

With regard to *utilization*, some analysts fear that evaluations are deliberately ignored or misused in policy-making (Chelimsky 1987, Sanderson 2000). Even if these fears are well-grounded, evaluative findings hold the power to accumulate general knowledge (rather than only instrumental ones) and over time create educated environment in which policies are crafted (Sanderson 2000), i.e. this is what Sabatier calls the 'enlightenment function' (1988: 131). Note that evaluations could be influenced by the client's agenda or by the political climate at large. To counterbalance any bias in this regard, evaluators could use comparative research of similar policies/ cases in different settings and thus improve the chances for generalization of their research results.

Furthermore, the timing of policy evaluation is crucial as well. Sabatier (1988) and Bovens, 't Hart and Kuipers (2006) refer to the peculiar possibility that programs might be perceived as failures immediately after or during their implementation, but may in a long-run perspective

get more favorable evaluations. The opposite situation may also be true (Marsh and McConnell 2010). Again, policy actors and the political climate might play a role. In order to neutralize this time-induced bias, Sabatier calls for assessment of programs over periods of one decade or more. In the end, for policy evaluation and policy learning 'what matters is what works' (Martin and Sanderson 1999 as cited in Sanderson 2000).

With regard to the evaluation of the Bulgarian case, we can organize evaluation studies in groups. Vedung (2006) and Chelimsky (2008) provide *categorization* with respect to policy learning. First, the studies conducted for the reason of public accountability should produce meaningful results which help the general public ('the principal') in shaping opinions on current policies run by politicians ('the agent'). Studies evaluating past or current programs in order to generate policy-specific knowledge constitute the second strand of evaluations. Here the work of evaluators is seen as corrective measure useful for current programs (e.g. giving advice for improvement and cost-efficiencies) or as a building block in designing new programs (or, conversely, dismissing such plans). According to Vedung, the third category includes studies which are usually initiated by academics and aim at accumulation of basic knowledge. Chelimsky, however, proposes a different view. In her categorization the third group – specific development evaluations – usually presumes access to confidential data and thus it is not intended for public circulation but rather for supporting the work of a certain client.

The evaluation of the Bulgarian RES case which I conduct in this paper makes use of this categorization. Tackling the RES conundrum in this case aims at policy-specific insights (and recommendations) and generation of basic academic knowledge. Measuring success or/ and failure of the renewable energy policy in Bulgaria shall be done bearing these two types of

evaluations in mind.

1.2. Support mechanisms for green electricity

Recent studies document the benefits of introducing more energy from renewable sources as a protective measure against the detrimental impacts of high oil prices and also highlight the need for counter-measures against fossil fuel subsidies (Fouquet 2013, Krozer 2013). As of 2010, over 100 countries had some sort of RES promotion policy in place compared to 55 in 2005 (Fouquet 2013: 15), i.e. almost twice as much dissemination of policies in just 5 years. Efforts in support of green energy are now becoming evident. In 2010 around 40% of the new net power capacity installed in the EU (which stands at 56.3 GW) was RES installations. Solar PV power plants led the way with 13.5 GW of new capacity for the same year (Joint Research Centre 2011). The drivers behind this expansion stem from the adopted support schemes: administrative and market-based ones.

Starting with administrative measures, probably the most widely adopted support scheme are the feed-in tariffs (FiT). In this model, producers of electricity from RES sell all their energy to grid operators and utilities according to a lucrative tariff. The latter is composed of basic energy price (average price in the conventional energy mix) plus a premium payment called green supplement, which depends on the energy source (e.g. wind, sun, hydropower) and the type of technology employed. Up until now highest FiTs were usually given to solar PV projects and emerging technologies which require very high initial investments.

For the 10-year period between 1999 and 2009, the number of countries with this mechanism increased almost fivefold, to a total of 63 (Fouquet 2013: 15). The attractiveness lies in the

good revenue horizon they provide for investors. For example, the basic rationale behind the German FiT scheme – a classic example in the industry – is that owners of green power plants will sell their electricity according to fixed prices for up to 20 years, but each year as the total capacity increases, new entrants will get lower tariffs (White et al. 2013: 7). The model allows for price and investment predictability but also puts pressure on market participants for improvements and lower public costs. In general, most FiT schemes do not set a cap on the total RES capacity installed and utilities are legally obliged to buy out all produced energy.

Another set of administrative measures are the so-called fiscal incentives. These include various tax cuts, tax exemptions, tax refunds, excise duty exemptions for certain activities such investment in RES projects or consumption of green electricity. For example, the Czech Republic, France, Luxembourg and Belgium encourage RES development by modifying direct taxes such as the personal income tax, e.g. through deductions (Cansino et al. 2011). The most wide-spread fiscal incentive for RES technologies in the EU is the exemption from electricity excise duty which is applied in six member states (ibid.).

The tradable green certificates are the most recognized market-based incentives. In this system utility companies or producers should declare a certain amount (quota) of green energy distributed or generated. The certificates serve as proofs for fulfilled requirements and can be freely exchanged both nationally and internationally. In other words, the desired target for share of renewables under this system is decided by the government, while the price of certificates stems from market supply and demand (Fouquet 2013: 16). In some cases the government can introduce price floor for certificates in order to guarantee invested money, but it can also set price cap and give signal to end-consumer what the maximum burden

might be (Todorova 2013).

Furthermore, this system allows for separation of the energy as such from the environmental obligation, i.e. energy can be sold separately from the certificates and the price of the former is not affected by the price of the latter (Georgiev 2013). Due to its market nature, green certificates' trading holds the potential for huge costs savings. Recent modeling suggests that if the EU develops a trading platform for the entire bloc, this could cut overall costs for achieving the 2020 target by nearly 70%, given the different national targets (Aune, Dalen and Hagem 2012).

An important note should be made with respect to the market-oriented drive in the EU. In order to foster competition and lower prices, the bloc tries to 'unbundle' the energy sector, separating ownership and operations along the chain from energy generation to transfer and supply. At the same time, the EU has set targets which require mandatory use of specific energy sources no matter their market competitiveness, i.e. this looks more like centrally planned energy economy, not one which is market-oriented (Communication with Atanas Georgiev). In short, there seems to be an apparent tension between the EU's liberalization efforts in the electricity sector and the promotion of renewables.

No matter what the specific incentive scheme is, most investors need additional funding which usually comes in the form of bank loans. According to Moore and Smith (2007), most often developers are requested to cover up to 40% of the total cost of a project and the rest is covered by the respective bank. The agreed share of loanable funds will largely depend on the bank's perception for risk (2007: 5-6). Due to the risk averse disposition of most banks, projects that are expected to run according FiT regime seem to have better chances of getting

credit than ones working in market conditions. This is one of the main reasons why FiT is the predominant mechanism for RES support, while the use of green certificates remains “almost negligible” (Fouquet 2013: 15-16).

1.3. Renewable energy policies in Central and Eastern Europe

There are several factors which currently influence decisions in energy policies of countries in Central and Eastern Europe (CEE) with regard to more intensive deployment of renewables. First, most studies in this field acknowledge that to a large extent countries in the region remain dependent on Russian supplies for their basic energy carrier, usually natural gas (Moore and Smith 2007, Frost & Sullivan 2009). In recent years Russia's inclination to seize gas supplies for non-predictable reasons has urged many governments to seek alternative sources of energy, including different gas routes, exploration for own fossil fuels and RES incentives. Second, EU countries and/ or signatories to the Kyoto Protocol of 1997 face legal obligations to cut GHG emissions, which would ideally lead to lower consumption of fossil fuels. This drive for 'greening' the industry and the power sector implies more efforts in energy efficiency and support for the transition to RES. The report by Frost & Sullivan summarizes the trends:

The 2020 targets for the EU member nations is the most significant driver for the CEE countries. The targets, coupled with energy security issues, are boosting the renewable energy market in CEE, making it attractive for investors and market participants. (2009: 1)

Another reason which contributes to more concentration of capitals in the renewables sector in CEE countries is the saturation of Western markets, especially Germany and Spain. Compared to the latter two countries, the potential of the region looks underdeveloped, and

chances are “first-movers” still have competitive advantages². Investors in new developments in Eastern Europe, however, often face lack of strong, permanent political commitment and bureaucratic obstacles. Analysts point to “cumbersome planning procedures and lack of focus on strong and efficient incentive mechanisms” (ibid.).

Focusing on Bulgaria, investment conditions did not look good in spite of high FiTs and the “penetration of renewables [is] especially difficult as the current commodity prices for electricity are still relatively low” (European Renewable Energy Council 2010: 176). According to different estimations, Bulgaria has large unexploited potential for energy from biomass, biogas and waste (Moore and Smith 2007, European Renewable Energy Council 2010). However, the market space for solar PV, wind parks and small-scale hydro-power plants mentioned in the same reports now looks saturated.

In terms of evaluating the 'policy vs. market' interplay, so far research interest in Bulgaria's RES policy has been limited. Pre-boom studies claiming that the Bulgarian policy “has not been effective enough in encouraging renewable energy production and consumption” (Koleva 2010: 70) now seems less relevant. Some publications deal specifically with technical capabilities of different energy sources and make overview of what has been installed as generating capacities (Mihaylova and Aladjadjian 2009, Markova et al. 2011), while others tackle inefficient pricing in the sector (Letskovska et al. 2012). These works barely touch upon any substantial policy critique, especially after the boom-and-bust crisis from 2012.

To sum up, there is a large body of literature that deals with different aspects of green energy

² Though latest evidence from Bulgaria's solar PV sector, found in this paper, and from Romania's wind energy industry (see Karasz 2013) shows that these opportunities are now to a large extent exploited.

policy, RES market introduction and incentive schemes. However, qualifying certain policies as more or less successful requires decomposing them to operationalized dimensions. As the review suggests, analyses of the Bulgarian case through such a framework have not been done before. This evaluation could give us richer understanding of the success-to-failure spectrum, especially with respect to the renewable energy policy, and point to potential real-world solutions.

Chapter 2: Case selection and analytical framework

This chapter has two objectives. First, in order to justify the case selection, it makes a brief overview of Bulgaria's energy sector and contrasts it to those in Greece and Romania. Of all EU countries promoting RES, these two are similar to Bulgaria in many respects – politics, economy and geography – so a comparison could highlight subtle differences relevant to this paper. Second, the chapter frames the way I evaluate success and failure, building on the *process-program-politics* division (Bovens, 't Hart and Kuipers 2006, Marsh and McConnell 2010, McConnell 2010).

2.1. The Bulgarian energy sector in regional perspective

Diversity of technologies and input resources characterize Bulgaria's energy sector, though in terms of geography, significant share of the primary energy carriers are imported from one supplier. More specifically, natural gas and oil for liquid fuels come from Russia. Nevertheless, about 60% of energy needs in the country are met by domestic inputs such as lignite coal, wood biomass and nuclear fuel³ (DG for Economic and Financial Affairs 2013: 83). Not surprisingly, latest research confirms the low levels of energy efficiency in Bulgaria, arguing that it is “the most vulnerable [EU] Member State as far as energy and carbon intensities are concerned. Performances are worrying across all segments of the economy. [...] the country reports the highest share of energy loss in the EU” (ibid.). In other words, we can speak of Bulgaria as an extreme case in terms of low energy efficiency compared to the rest of EU countries.

³ Nuclear fuel is considered domestic source under national legislation, although it is actually also imported from Russia.

Focusing on the electricity sector, with the addition of around 1000 MW of solar PV projects to the grid last year, the total capacity of all power plants in the country reached 13 800 MW (European Commission 2013a). However, the largest generating facilities are conventional and serve as base load: Kozloduy NPP (2000 MW), Maritsa East 2 TPP (1600 MW), Contour Global Maritsa East 3 TPP (908 MW), Chaira pumped storage hydro power plant (864 MW) (Capital.bg 2013).

The sector is characterized by large state involvement in terms of ownership and regulations, which often lead to market distortions. With regard to ownership, the Bulgarian Energy Holding (BEH), established in 2008, incorporates all large companies in the sector which are wholly owned by the state. Among them are Natsionalna Elektricheska Kompania (NEK)⁴, Kozloduy NPP, Maritsa East 2 TPP, Maritsa East Mines, Bulgargaz, Bulgartransgaz and others (Ministry of Economy, Energy and Tourism 2012). The market of electricity remains predominantly regulated despite efforts to open up space for free competition under the EU's Third legislative package for electricity and gas markets. There is, however, a slight expansion of the liberalized market segment – in 2011 it reached around 35%, up from 27.1% in 2010 (Energy Management Institute 2012). The government pushes for putting in operation an energy exchange, but so far the progress is limited. Everything outside the open market is produced and sold according to prices set by the State Energy and Water Regulatory Commission (SEWRC) – an agency which is formally independent from the government but its board is appointed by the Council of Ministers. For example, as of 2012 the commission has the legal right to decide on FiTs several times a year, while the amount of the green supplement is set on an annual basis. The commission usually pays special attention to

⁴ National Electricity Company or NEK is the state-owned operator of the high-voltage electricity grid, but it is also a player on the production side with ownership of many hydroelectric plants and shares in coal power plants. The controversial project for the second Bulgarian NPP in Belene was tendered by NEK. The company also holds a license as an electricity trader.

pricing, since Bulgaria is among the worst performing countries when it comes to coping with energy poverty. According to an European survey, “64.5 per cent of Bulgarian households could not keep the home ‘adequately warm’, while 32.1 said that they were facing arrears on utility bills. These were by far the highest figures within the EU-27” (Bouzarovski et al. 2012: 80). Given that the standard definition for energy poverty states that more than 10% of the households income is spent on utility bills (energy and water), Bulgaria definitely falls into this category, with households spending around 14% on average of their income for these services (Center for the Study of Democracy 2010: 20).

The regulator often suppresses tariffs for households despite calls from experts and the industry that such short-sighted moves distort the market and will, eventually, hit back on policy-makers because price hikes could not be avoided forever. Ironically, the proliferation of RES for electricity generation in the past couple of years has been accompanied by increasing use of cheap solid fuels like wood and coal for local heating. Poor households shifted their consumption towards cheaper, polluting alternatives in times of overall energy price hikes, i.e. this is what Bouzarovski et al. call “energy degradation” (2012: 80).

Bulgaria's EU neighbors have their own distinct features in terms of energy generation and consumption. In Greece, for example, more than half of the energy consumption is covered by imported oil , but in contrast to Bulgaria, it comes from geographically diverse suppliers: Russia, Libya, Saudi Arabia and Kazakhstan, to mention a few (DG Economic and Financial Affairs 2013: 117). This diversification mitigates the risk of sudden supply cut-off. Furthermore, the Greek state holds the controlling share in some of the largest companies in the sector, but it is not the only significant shareholder. For instance, around 51% of the Greek Power Corporation (DEI) – the Greek analogue of Bulgaria's NEK – are state-owned,

and in the largest Greek natural gas company DEPA the state keeps 65% (Michaletos 2011) whereas the rest of assets are held by different entities. Energy poverty is not as severe as in Bulgaria, yet various figures suggest it is a persistent problem (Santamouris 2006 et al.), amplified by the current economic downturn. With a total of 1.72 GW of installed capacity, the solar PV sector in the country expands considerably (Shahan 2013). Symptoms of a PV bubble now become apparent – around 300 MW were put in place only in January 2013 despite plans of the main grid operator for 121 MW (ibid.).

Romania, for its part, has large reserves of oil and gas on its territory which makes it one of the least energy dependent countries in the EU (DG Economic and Financial Affairs 2013: 225). Despite its own reserves, the country is net importer of oil, getting supplies from Russia and Kazakhstan (2013: 227). Like Bulgaria, Romanian economy also suffers from high energy and carbon intensities, though improvements are seen in recent years. Through the Ministry of Economy, Trade and Business Environment, the state keeps majority shares in the largest heat and electricity generating companies: Hidroelectrica, Nuclearelectrica, and Termoelectrica (KPMG 2012: 4). In terms of liberalization, as of October 2011 about 56% of the electricity market is considered to be open for competition (KPMG 2012: 2), which puts Romania in front of Bulgaria on the road to fully market-based energy sector. Currently, the RES projects are on the rise in Romania, forcing the government to consider serious cuts in preferences, especially for wind farms (Karasz 2013).

To sum up, Bulgaria's energy sector is unique in terms of overarching state-intervention, geographical dependence on one fuel supplier and high levels of energy poverty (the latter implies weak tolerance to additional fees such as green supplements). However, the country has higher installed electric capacity per capita (1.6 kW) compared to Greece and Romania

(1.25 and 0.96, respectively⁵), which makes the case even more interesting if we contrast this with high energy poverty rates. This is the political and economic background against which policies and project deployment are taking place. In this context, further analyses and evaluations represent a unique intellectual exercise with significant potential for research contributions.

2.2. How to think of policy success and failure – a framework for analysis

The evaluation I make in this paper takes the perspective of the government as the main policy player, i.e. which moves of the Bulgarian government were successful and which were not⁶. As Chapter 1 made it clear, the literature abounds with discussions on policy evaluation as being 'goal-driven' and 'value-free' or embedded in the broader social landscape, where values influence decisions and assessments. The strong interest in this topic stems from the fact that “...evaluations are virtually the only moments when existing policy trajectories can be reassessed and historical path dependencies may be broken” (Bovens, 't Hart and Kuipers 2006: 322). Bearing in mind the adopted middle-ground approach, i.e. between value-free ('objective') and value-based ('subjective') evaluations, in this section I present an understanding, which postulates that a given policy maybe successful in one sense and completely disappointing in other. If there is no agreement on the nature and criteria for evaluation, there is also no agreement on what constitutes success. Value-free criteria are detached from the real-world complexity and produce one set of results, while value-based approaches are subjective and depend on whose beliefs are taken as pivotal in evaluations. Hence, they lead to different results.

⁵ Calculations are based on UN statistical data for 2009 – 2010.

⁶ I chose this perspective because it is the most relevant in terms of public policy. Other perspectives might produce very different results. For example, investors who make windfall profits throughout the PV boom would perceive the policy as totally successful and without any traces of failure.

As a first step in presenting the analytical model, I subscribe to the definition of policy success proposed by McConnell (2010), which tries to reconcile both perspectives:

A policy is successful if it achieves the goals that proponents set out to achieve and attracts no criticism of any significance and/or support is virtually universal. (2010: 351)

Conversely, failure is “the mirror image of success” (2010: 356), a policy which misses its target and is faced with mass opposition and lack of support even among its proponents. Some scholars suggest the use of a third category – non-failure – which supposedly is applicable to instances when evidence is inconclusive and does not point to success but it is also far from failure, i.e. there are many shades in the spectrum.

The model I employ is based mainly on the distinction between *programmatic* and *political* success, which originates from a comparative research by Bovens, 't Hart, and Peters, published in 2001. In addition, I also use the third dimension of this categorization – the *process* success – proposed by Marsh and McConnell (2010) and McConnell (2010). Each dimension is operationalized through a set of indicators put forward by Marsh and McConnell (2010), which I have adapted to the specificities of renewable energy policy. So what does this three-layered template postulate?

In the realm of *process* success, formulation of problems and exploration of policy options are done in transparent, legitimate and non-contested manner. The merits of every policy are measured in purely formalistic fashion, e.g. whether the government is able to push legislation through parliament without significant amendments and how quickly this can happen. This, however, does not guarantee whether the implementation (even if it is conducted according to initial plans) would make affected parties better off (or whether they

would appreciate it). Marsh and McConnell (2010) continue by adding policy innovation and transfer of practices from other jurisdictions as part of what they consider process success.

With regard to the Bulgarian case in this paper, I find the following key indicators for process success/ failure most appropriate for evaluation: the deliberation and passing of the respective legal and regulatory acts; frequency of legislative/ regulatory amendments; compliance and harmonization of EU directives; and consultation process with affected stake-holders (industry and consumer associations).

A rationalist drive to “to rate policies by the degree to which they achieve the stated goals of policy makers” rules in the *programmatic* domain (Bovens, 't Hart and Kuipers 2006: 329). In order to evaluate here, one needs evidence in the form of outcomes, data on effectiveness, efficiency or waste reduction (Marsh and McConnell 2010: 573-574). Importance is given not only to evaluation reports commissioned by the agency which adopted the policy, but also to those reports prepared by affected stake-holders and third-party representatives.

For the case study in this paper I find the following indicators most appropriate for measuring program success: meeting (indicative) target for share of RES in the final energy consumption, attracting or discouraging investments in the sector, and introducing green energy in cost-efficient way.

The *political* dimension of success is probably the most controversial of the three arenas. The assessment could be entirely dependent on a beliefs-driven “world of symbols, emotions, political ideology, and power relationships” (Bovens, 't Hart and Kuipers 2006: 330). Shaping public opinion, portraying appropriate image of a policy in the media, publicizing persuasive

argumentation (ir)relevant of actual programmatic progress are the key factors for success in politics. For instance, a policy targeting specific outcome (e.g. increase of green energy consumption) maybe successful since the programmatic goals are achieved, but it jeopardizes the governments' term in office due to higher electricity bills and social discontent. Clearly, this is a recipe for political failure, if the government does not take measures to mitigate the financial burden on society. In this realm “some would claim policy success to be nothing more than a social construct reflecting power relations” (Marsh and McConnell 2010: 570).

In terms of political success, the RES policy in Bulgaria is measured through the government's popularity, prospects for reelection, popular attitudes towards green energy policies, and opinions of investors and the media. Table 1 in Appendix I summarizes the most important aspects of the framework.

Using this three-dimensional analytical lens, in Chapter 3 I test evidence against a null hypothesis. Based on the policy overview made so far, the null hypothesis claims that Bulgaria's renewable energy policy is a failure because it fueled an unsustainable boom and a consecutive bust in the sector. Chapter 3 explores which aspects of the policy resulted in success (if any) and what type of success, and which aspects led to failure.

A few remarks should be made on why I chose this framework. The approach of Marsh and McConnell (2010) and McConnell (2010) is relevant to real-world challenges of assessments and value-judgments, i.e. the 'success vs. failure' distinction is not monochromatic snapshot, but a rather colorful and nuanced spectrum. Hence we talk of degrees of success and failure rather than a clear-cut dichotomy.

The suggestion for adding non-failure as separate distinction comes to show how intricate evaluations may be, especially when faced with insufficient or unconvincing empirical evidence. Since the energy policy field is inhibited by many stake-holders and conflicting interests, it is reasonable to expect a nuanced picture as a result of the evaluation.

Chapter 3: Case study – Boom and bust in the renewable energy sector of Bulgaria

In this chapter I disentangle the Bulgarian RES policy conundrum using the outlined framework. The analysis begins with background information on how green energy policy came about in Bulgaria. In the second part, the case details are applied against the three-dimensional division. A summary of the findings concludes the section.

The analysis relies largely on the four semi-structured interviews I conducted in April and May 2013 in an effort to gain in-depth contextual and policy relevant information. The interviewees represent a fairly balanced sample of experts on RES issues. Two of them – Nikola Gazdov, Chairman of the Bulgarian Photovoltaic Association (interviewed on 29 April), and Mariyana Yaneva, Deputy Executive Director of the Bulgarian Wind Energy Association (interviewed on 29 April) – work in the industry and know the business side of green energy.

One of the interviewees, Kostadinka Todorova (interviewed on 27 April), was the Director for Energy Efficiency policy at the Ministry of Economy, Energy and Tourism (2005 – 2010) and an adviser to the Commission of Economic Policy of the 41st National Assembly (2010 – 2013). She participated in preparing drafts of various energy-related regulations. The last expert comes from the academia. Atanas Georgiev (interviewed on 17 May) is Assistant Professor at Faculty of Economics and Business Administration at Sofia University and Chief Editor of Publics.bg and Utilities magazine.⁷

⁷ For this research, I also contacted Delian Dobrev, former Minister of Economy, Energy and Tourism (2012 – 2013), member of parliament and one of the people behind the 2011 RES law, and a representative of the state regulatory commission. Both were unavailable to give interviews.

3.1. Renewable energy policy of Bulgaria – background information

The first attempts in Bulgaria to develop commercial renewable energy projects based on modern technology date back to 2005 - 2006 and involve wind installations (National Renewable Energy Action Plan 2010, Yaneva 2013). At that time, however, there was no legislative framework specifically for RES investments. The first law – the Renewable and Alternative Energy Sources and Biofuels Act (RAESBA) – was adopted in 2007, putting the sector in the spotlight. The administrative experience with handling such projects was limited.

Following two EU directives, the RAESBA set preferential conditions for green electricity generation and also introduced mandatory share of ethanol and biodiesel in transport fuels. Under RAESBA, NEK and all regional suppliers were required to give priority to RES power with regards to grid connection. Moreover, the suppliers had to buy all RES electricity according to feed-in tariffs (the only exception being hydro-power plants over 10 MW which are not considered RES). Generators should sell energy according to long-term contracts with energy distributors. According to the 2008 amendments, the contracts for geothermal and solar PV installations last 25 years, and those for wind and hydro-power plants – 15 years. The parliament authorized the SEWRC to set FiTs once a year, using as a base component 80% of the average price in the energy mix from the previous year and a green supplement which varies according to the specific technology and RES. Small-scale solar PV projects used to get the highest tariffs. Reflecting current market dynamics, each year the SEWRC could increase or decrease the green supplement by 5%. Many project developers criticized this provision, arguing that it is hard to get loans given the risk associated with unclear future cash flows. Many banks refused to finance projects (Gazdov 2013).

Despite seemingly weak activity, by the end of 2009 the number of project proposals rose dramatically, reaching total potential capacity of 12 GW (Dnevnik 2010), i.e. as much new electric power as already installed. However, most projects remained on paper, since their owners could not secure financing and contracts for grid connection. The ministry of environment considered moratorium on new projects until all issues are cleared. The idea was later dismissed due to potential conflict with EU legislation (Gazdov 2013).

In the summer of 2010 the ministry of economy and energy published a draft of Bulgaria's National Renewable Energy Action Plan (NREAP) as requested by the European Commission. According to the plan, the 16% target should be achieved by having 2549 MW of installed hydro-electric power, 303 MW of solar PVs, 1256 MW of on-shore wind farms, and 158 MW of biomass installations. As of 2010, there were 2090 MW of hydro installations, 9 MW of solar PV, 336 MW of wind parks and no biomass power plants.

In line with the 2009 EU directive on renewables, the government announced that it is preparing entirely new law in order to implement the directive and improve existing regulations. After prolonged public discussions with investors, in April 2011 the parliament adopted the Energy from Renewable Sources Act (ERSA) which repealed the RAESBA. To control the pace of deployment of new projects, the new act introduced several significant changes. First, once a year the regulatory commission could increase or decrease the green supplement in the feed-in tariffs as much as it deems reasonable. Second, once a RES project begins operation, its FiT remains constant for the entire period of the power purchase contract, which removes the price risk affecting bank financing. Third, the mandatory power purchase periods were reduced to 20 years for electricity from solar PVs and to 12 years for wind farms. Fourth, as way to filter out speculators, the law introduced payments in advance

which investors should make to grid companies when signing preliminary contracts. Fifth, in order to tame the massive investment inflow, grid operators were required to report what capacities are available for connecting new RES projects every year. Finally, the parliament removed the possibility for a green certificates scheme, envisioned in the 2007 act.

Meanwhile, the international markets for energy equipment experienced fast-paced transformation, with solar PV technology being again the case in point. Intense competition, economies of scale, relatively cheap input materials like polysilicon, alleged dumping from China, and strong demand from European markets led to dramatic price reductions (Wynn 2013, Yaneva 2013). From 2008 to 2012 the average prices of silicon solar modules offered by the top-10 global producers have dropped by more than 80% to \$0.7 - \$0.8 per watt (Wynn 2013). The drop was particularly sharp from 2011 to 2012. The energy regulatory commission in Bulgaria did not have legally the flexibility to adjust FiTs in line with rapidly falling capital expenditure (solar panels).

The market dynamics increased the number of investors, who wanted to benefit from cheap panels before lower electricity tariffs are adopted. As a consequence, by the second half of 2012 the total installed capacity of solar PVs skyrocketed to around 1 GW, making the projections in the 2010 NREAP irrelevant (see Table 2 in Appendix I). Similar growth is impossible with wind and biomass facilities because they require more planning (Yaneva 2013). The regulatory commission and grid operators were obliged to connect everybody but did not plan properly. One example is particularly striking:

The biggest discrepancy occurred in the network of EVN⁸ where they predicted 80MW of new projects but actually connected 480 MW to the grid, all of them PV installations. (Yaneva 2013)

⁸The main electric utility in South-Eastern Bulgaria

Overall, the accumulated financial deficit of 100 - 120 million leva was now expected to reach 300 million leva, i.e. 150 million euro (Stanev 2013, Yaneva 2013). In desperate attempt to close the gap, the SEWRC tripled the amount of green supplement charged to end-consumers to 11 leva per MWh (Todorova 2013). This was one of the reasons for the 13% price hike⁹, unseen by households in previous years.

In the mean time, the parliament amended the legislation and as of the middle of 2012 it allowed the SEWRC to change FiTs as many times per year as necessary. This was too little, too late. The regulatory commission cut the FiTs for new projects but no new investments took place. Currently, the SEWRC revises the latest grid development plan of NEK to see what infrastructure will be rolled out in coming years, but “one thing is for sure – they are not connecting projects this year” (Todorova 2013).

Not only grid companies stopped connecting new projects, but in September 2012 the SEWRC introduced grid access fee for all existing RES installations (Nikolova 2012). The idea – to help utilities raise money and close the financial gap – is understandable, but it was implemented as in no other country. Several investors took the regulatory commission to court, claiming that the fee is discriminatory and against legal provisions for priority grid management of RES electricity (Yaneva 2013). The decision was repealed on first instance and now investors expect the final court ruling.

⁹ As a matter of fact, three other variables also contributed to the price increase: a) coal power and associated EU carbon allowances which as of 2013 should not be allocated for free; b) long-term contracts with two US-owned coal power plants whose energy is purchased according to fixed tariffs; and c) incentives for combined heat and power (CHP) installations which are similar to the FiT for renewables.

3.2. Between success and failure - application of the case against the framework

As mentioned earlier, the analysis considers policy success and failure from the perspective of the government. In other words, in this section I look at which governmental policy steps proved to be successful, which aspects were failures, and which lie in between.

3.2.1. Exploring process success and failure

Problem identification and formulation of appropriate policy measures, linked to the Bulgaria's renewable energy action plan (NREAP), suffered from unrealistic assumptions from the very beginning. Kostadinka Todorova pointed out that NEK made optimistic forecasts about increasing energy consumption and production because it had inadequate assessments of the structure of the economy, the demographic decline and the construction of the Belene NPP project. In short, much less generation capacity is actually needed. However, “The preparation of the NREAP was conducted under the watchful eye of the nuclear lobby which claimed that green energy and nuclear energy are incompatible, i.e. the state should develop the latter type of energy and not the former” (Todorova 2013). In the end, the initial projections for solar PVs proved too conservative. Furthermore, while EU legislation emphasized on how much renewable energy should be consumed, the Bulgarian NREAP is more focused on large-scale production, ignoring domestic solutions such as solar water heaters and biomass boilers (ibid.).

With respect to the NREAP, the government was procedurally successful in crafting the plan, while also resisting to criticisms from the industry and environmental NGOs over the scope and areas of the power plants deployment. The ministry of energy also secured approval of

the plan from the European Commission. In terms of substance, however, the NREAP featured projections and assumptions that turned out to be completely detached from reality.

The preparation and adoption of the REASBA in 2007 attracted little public attention, since it was more or less perceived as formal harmonization with EU legislation. The government easily scored process success. In stark contrast, the ERSA of 2011 was much anticipated by investors and widely discussed in professional circles and the media. From the end of 2009 to early 2011 government and industry representatives gathered regularly in a working group, which was attached to the energy ministry, and produced around 30 drafts (Gazdov 2013).

However, one of most surprising decisions – on the shortened periods of mandatory energy purchase – was agreed upon just before the final voting and only between the ministry and some members of parliament. No one from the ruling party took clear responsibility for this and other controversial provisions in the final version. It is a wide-spread opinion that political patronage was 'the name of the game' and many RES projects are linked to members of parliament and other politicians (Georgiev 2013, Todorova 2013, Yaneva 2013). Lastly, frequent legal changes, or rumors of it, did not tackle the discrepancy between the law (i.e. goals) and the NREAP (i.e. means), which, for its part, was influenced by the Belene NPP project.

Due to its public visibility, the law and the debate around it produced many diverging opinions. In procedural terms, the government succeeded in pushing the legislation through according to its initial (and often changing) intentions but lost credibility in the eyes of the industry.

Regarding the SEWRC, its decision to charge green energy producers with grid access fee faced stiff opposition among investors who see it as illegitimate. The SEWRC made the decision almost in breach of the legal procedure for public consultations. Had the policy-makers opted for a tax on PVs as an instrument to tackle the financial gap, they should have made legislative amendments. “The whole process should have gone through the parliament stirring public discussion whereas the current decision was made on a Friday night behind closed doors” (Yaneva 2013). Moreover, as Atanas Georgiev explains, “It is not right a fee charged for grid service to cover deficits induced by the price of energy”.

3.2.2. Exploring program success and failure

On its way towards the 2020 target Bulgaria has to meet the so-called indicative shares of renewable energy. According to the EU legislation, in 2011 this share had to reach 10.72% of the final energy consumption. Latest publicly released data are for 2011, i.e. before the PV boom, and show the green energy hitting 13.8% (Eurostat 2013). This implies that in 2012 the share was even higher.

In 2011 the Bulgarian government officially pledged to aim at “Overperformance of the renewable energy targets” as part of the national energy strategy for 2020 (Energy Strategy of the Republic of Bulgaria till 2020, 2011: 42). The government overachieved its preliminary energy goal but in many respects (mainly related to cost-efficiency) this is a very problematic success.

First, the 2011 law introduced limited grid quotas for connection of new installations, which are determined annually. Coupled with accumulated projects, which were postponed due to

the political uncertainty surrounding the 2009 parliamentary elections (Gazdov 2013), the rush for quick deployment now seems logic:

Everybody knew that if more projects come online, grid connections will seize next year. As of 1 July 2012 we observed null capacity for renewables. [...] In other words, in May 2011 the members of parliament opened the door for the projects already on the table and gave investors one year. This was the worst possible signal. (ibid.)

Second, the one-year window of opportunity shifted investors' interest “away from projects requiring long-term efforts like wind and biomass” and channeled available funds to “photovoltaics where small projects can be implemented within 3 to 6 months and large ones for about a year” (Yaneva 2013). Moreover, according to Yaneva, the peak of wind capacity deployment had already occurred in 2010.

Third, the solar PV expansion promised more financial problems in combination with the higher feed-in tariffs compared to all other RES technologies. Going back to the legislative negotiations in 2011, Nikola Gazdov (2013) recollected extensively:

In February 2011 during one of the working group sittings in the parliamentary economic committee I proposed the tariffs to be cut by at least 20-25% which resulted in confusion. After that I got very angry calls from investors.

... It was clear that if the parliament adopted the draft the way it was proposed by the energy ministry, this would overheat the market. [...] We wanted the renewable energy act, but we didn't want such attractive conditions in it – long mandatory purchase periods and high fixed tariffs... we had already seen similar cases in the Czech Republic and Spain where the combination of attractive conditions and large amount of projects in the project pipeline led to fast construction. [...] So nothing surprising happened in Bulgaria.

In terms of cost-efficiency, this was certainly not the best way to progress towards green energy targets. The previously discussed scenario – Bulgaria postpones fulfillment of the EU target for a few years until technologies get cheaper and energy pricing is flexible – is relevant, but no longer possible. In reality, most PV projects benefited from high FiTs which ultimately are collected from end-consumers, while at the same time bought relatively cheap

equipment. Atanas Georgiev (2013) illustrates this point saying that:

I remember a conference where in one of the panels a representative of the regulatory commission explained the need for 20-year fixed price of photovoltaic electricity, and in the next panel a Chinese manufacturer said that under these tariffs you would get returns on investment in 7 years.

Going back to political patronage, it is fair to say that some politicians had the narrow self-interest to keep feed-in tariffs high (and thus a heavy burden on consumers) as long as they can get their projects through. “The sector was seen as a good opportunity to drain public funds” (Georgiev 2013). This implies achieving the goals at non-optimal costs. As Yaneva (2013) put it, the lack of an adequate link between the NREAP and the 2011 law resulted in a situation in which “no one tracked who, when and how much capacity installs. [...] No one was able see whether there was any control over contracts”.

There is another, more simple and less costly way to get higher percentage of renewables in the mix and thus reach the policy goal. Even if holding green energy generation constant in absolute terms, its share could become higher compared to potentially lower consumption. This could be achieved through efficiency in production and more use of heat instead of electricity for heating (Todorova 2013).

3.2.3. Exploring political success and failure

Politics is the most contested dimension of policy success and in the case of Bulgaria's RES policy this is quite evident. Though green NGOs are silent and probably satisfied with the 2020 progress, the policy left the majority of end-consumers and some investors deeply unhappy. As a result from the price burden of green electricity, imposed on households (voters), the popularity of the government suffered severely. The public discontent over this

issue was one of the drivers behind the mass street protests in Sofia in early 2013 which forced the Council of Ministers to resign. However, Gazdov (2013) warned against possible retroactive measures for RES preferences: “... the effect is negative – the state buys something which is overpriced and post factum it punishes investors for its own mistake.”

The main factor in this dimension is the lack of transparency, which opens the door for negative attitudes and dims the prospects for political success. Among the many shortcomings are the lack of complete public data on RES deployment, the number of expected projects, the number of requests for permits, and the miscommunication between agencies (Gazdov 2013, Todorova 2013, Yaneva 2013). According to Yaneva (2013), when a sector works under regulated prices, “the lack of sufficient transparency could allow for someone to jump ahead of his place in the waiting line” for grid connection. Another big issue is, again, the uncertainty which stems from the frequent changes of the rules.

With regard to the wide-spread concerns over the households sector, Todorova (2013) proposes that “the invoices should state how much energy comes from coal, nuclear, renewables or CHP. The green energy supplement should be removed...”. Furthermore, had the state implemented better energy efficiency policy towards households, end-consumers would have been more resilient to price hikes. In other words, the price of energy would be less important for the government's popularity and its prospects for staying in office.

3.3. Summary and discussion of the findings

The only aspect of Bulgaria's RES policy which can be determined as successful without any doubt is the progress towards the 2020 target. As an overachiever, Bulgaria could set an

example for more developed countries among the EU's old member states. However, as Marsh and McConnell put it, “an 'excess' of success can produce a failure” (2010: 578). Procedural tricks when adopting new rules, problematic cost-efficiency, and insufficient coordination with energy efficiency measures, lack of transparency, decreased public support and confusion among investors – all this pushes the final evaluation towards that part of the spectrum where failure lies. The solar PV boom had implications for the sector as a whole – both in financial terms (e.g. the grid access fee applied to all RES projects, not only to PVs) and in terms of social perceptions. The policy response to the PV boom – blocking new RES projects and charging companies with controversial fee – comes to illustrate the deepening impression of a failing governmental and regulatory intervention.

However, looking at the three dimensions of success and failure, several more nuanced inferences could be made:

- In terms of *process*, Bulgaria's RES policy is successful as far as EU directives are implemented (policy transfer) and consensus on non-contested issues (e.g. fixed tariffs) was codified in the legislation. Nonetheless, undue political influence during the set-up phase of the policy and procedural flaws were bad for the transparency and legitimacy in the sector as a whole;
- As a *program*, the RES policy succeeded in introducing more green energy to the grid but the economic and social costs seem too high, especially in a country marked by severe energy poverty and low energy efficiency. The big financial gap between high spending on FiTs and insufficient revenues from the green supplement is evident for the poor cost-efficiency; Furthermore, due to grid connectivity issues, the solar PV

bust closed the door for many non-PV projects, and thus it cut off new investments in renewables;

- The results in the *political* dimension are the darkest – for opposing reasons, both consumers and investors have negative attitude towards the current policy. In the mean time, the government and the regulatory commission need to tackle the financial deficit and propose an alternative course (if any) which could keep prices low and support investments. The sense of failure is further intensified by the lack of transparency in terms of data availability.

Drawing a line, it seems that the null hypothesis I set in Chapter 2 (“Bulgaria's renewable energy policy is a failure”) can not be neither fully confirmed, nor completely ruled out. The case study showed that Bulgaria's RES policy is more or less successful with regard to process and programmatic success, but it turned out to be a rather significant political failure. To sum up the mixed outcomes of all three policy realms in one sentence, it would be fair to say that this policy is a *bitter non-failure*.

A few important caveats are worth mentioning. The results of this evaluation represent an analytical snapshot. It does not provide complete and objective picture of the state of affairs, not least because it relied on qualitative methodology. Moreover, as discussed in Chapter 1, timing might be a crucial factor for policy evaluations and learning. A new assessment of Bulgaria's renewable energy policy needs to be made in few years time in order to see the progress towards the 2020 targets in broader context and mitigate the short-term influence on some affected policy actors.

Final remarks and recommendations

In the last decade the renewable energy sector developed largely because of incentives set up through policy frameworks. Renewable sources will have an increasing role in the future energy mix but, as this paper showed, they may come with an unpleasant price tag. In order to make RES introduction more cost-efficient, policy-makers should put more efforts in designing policies which produce balanced results.

The Bulgarian experience in this sector could provide a useful set of ‘dos’ and ‘don’ts’ for countries which intend to promote green energy or want to fine-tune their existing policy (Greece with its booming PVs is the case in point here). Striking the right balance between incentives, cost-efficiency and regulations emerges as a key to sustainable development of the energy sector.

Pointing to specific recommendations to Bulgaria, there is an ongoing discussion on how to make RES pricing more flexible and mitigate the overall financial burden. Some argue for more market-oriented approach – for instance, Bulgarian producers could sell green certificates in excess to producers and countries which are lagging behind their green energy targets. Others are still in favor of feed-in tariffs but with some modifications. For example, tariffs could be set to automatically decrease after certain amount of capacity is deployed for a given period. This is the so-called the German 'corridor model' (Gazdov 2013, Yaneva 2013).

With regard to the policy literature, the case study highlighted the broad spectrum of

variations between success and failure. Using the *process-program-politics* framework, the paper unraveled the nuanced outcomes of the Bulgarian RES policy. As a contribution to the academic dialogue, I proposed a new category – *bitter non-failure* – i.e. when in some dimensions success is evident, yet restricted, and in others the perception of failure prevails. This kind of qualitative distinctions are good to be used as benchmarks in the success-to-failure spectrum, but they are based on limited data and are prone to subjectivity.

In conclusion, a few remarks pointing to areas for further research deserve to be made. The analysis left several question without answer: what sort of evaluation design is most appropriate for energy policy given the many controversial issues which are involved? What factors (if any) can turn a failure into success? Is there any universal anticyclic measure for avoiding boom and bust? What would be the best policy response? Further research of these questions could produce meaningful results not only for academics, but also for practitioners in the real-world policy making.

Appendix I: Tables

Table 1. The three dimensions of policy success

<i>Dimensions</i>	<i>Indicators</i>
Process	Policy formulation and adoption are done legitimately, with little or no alterations of the original intentions made by proposing policy-makers.
Program	The implemented policy meets its stated goals and addresses its target audience, ideally in a cost-efficient manner.
Politics	The popularity and the credibility of the government increase due to favorable public perception of the policy.

Sources: Marsh and McConnell 2010; author's own elaboration

Table 2. Projected and actual PV capacity

	<i>2010 (pre-boom)</i>	<i>2012*</i>	<i>2020*</i>	<i>2012 (post-boom)</i>
Installed PVs (MW)	9	46	303	~1040
	* Projections of the 2010 NREAP			

Sources: Ministry of Economy, Energy and Tourism 2010, European Commission 2013a

Appendix II: Interview questions

Questions and topics for expert interviews:

1. Is it possible to balance the interests of renewable energy producers (profits) with consumers' interests (affordable energy prices) and those of the state itself (fulfillment of EU commitments)? How? Have the authorities (the ministry of energy and the energy regulatory commission) so far balanced these interests? Why yes (or, respectively, why not)?
2. What sort of policies did Bulgaria (the ministry of energy and the energy regulatory commission) apply after it became clear in 2012 that there are too many RES projects connected to the grid? What criteria were used in selecting these policies? How should energy utility companies (which buy green electricity according to FiTs set by the regulator) raise money to pay debt to renewable energy producers?
3. Have state and/ or corporate energy experts ever considered the introduction in Bulgaria of another incentive scheme for green energy which would be an alternative to FiTs (possibly able to correct its deficiencies such as insufficient flexibility to market conditions)? What sorts of criteria were guiding the decision to adopt FiT?
4. What kind of anti-cyclic measures could be applied in order to prevent boom-and-bust market situations?

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