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Strategic Planning For Energy Security

[1]Noncho Dimitrov

[1]Assoc. Prof. Dr.
[1]Department of National and Regional Security
[1] University of National and World Economy, Sofia, Bulgaria

Abstract: The article examines how Bulgaria, as an energy-import-dependent EU member, can use strategic planning to strengthen energy security while pursuing decarbonization and coping with geopolitical shocks like the Russia-Ukraine war. It argues that ad hoc, reactive policy is no longer viable and must be replaced by long-term, evidence-based planning that coordinates multiple institutions and stakeholders.

Using Bulgaria as a case, the author applies tools such as PESTEL to map political, economic, social, technological, environmental and legal constraints on the energy transition, from coal-dependent regions and affordability issues to investment needs, grid modernization and EU regulatory pressures. A key thread is the tension between coal phase-out, social stability in coal regions, and the need to rapidly expand renewables and storage while diversifying away from Russian fuels in a "friend shoring" context.

The article concludes that success depends on policy coherence, early and well-funded just transition measures, systematic integration of geopolitical risk, and adaptive management with rigorous monitoring, turning strategic planning from a formal document exercise into a living process that can guide Bulgaria's choices over the next decades.

Index Terms - Strategic planning, energy security, Bulgaria, EU member, EU regulatory.

I. INTRODUCTION

Energy security is one of the basic conditions for a country's sovereignty, economic growth and the general quality of life of its citizens. It is often defined, including by the International Energy Agency, as the reliable, uninterrupted supply of energy at prices people and businesses can afford. Behind this seemingly simple formula, however, stand a series of difficult strategic questions.

Today, energy security means much more than just keeping the lights on. It involves diversifying suppliers, making energy infrastructure robust, keeping prices manageable, encouraging technological progress, protecting the environment and managing geopolitical risks. For EU countries that rely heavily on energy imports, these issues have become even sharper, as they must meet ambitious climate goals while also dealing with disrupted supplies and market volatility after the Russia-Ukraine war.

Bulgaria is a good example of the difficulties that energy-poor European countries face when they try to plan their long-term energy future. The country has modest domestic resources: roughly a quarter of its energy comes from coal and around a tenth from waste biomass, which means it relies heavily on imported energy that is often tied up with sensitive political considerations. This dependence has turned into a serious vulnerability, especially in light of recent geopolitical tensions. On top of that, much of Bulgaria's energy system is rooted in older links with Russia, particularly in the nuclear sector, while its coal power plants are under growing pressure because of EU environmental rules.

In this context, strategic planning becomes crucial. In the public sector it is not just a business tool but a way to align different institutions, involve stakeholders, base decisions on evidence despite uncertainty, and adjust policies as conditions change. In energy, this means bringing together technical feasibility, economic costs and benefits, environmental goals and social fairness into a single, coherent approach. The article builds a structured framework for such planning in the field of energy security and uses Bulgaria as a detailed case study. It moves from theory to practice: first outlining key concepts, then applying tools such as PESTEL to the Bulgarian energy sector, examining how policies are coordinated, looking at implementation and monitoring problems, and finally drawing broader lessons for other import-dependent countries undergoing energy transitions.

II. Strategic Planning in Energy Policy

Strategic planning can be seen as a structured way of thinking that helps policymakers and managers decide what to do, how to do it, and why it should be done in that way. In the field of energy policy, it means working with data and well-founded expectations about the future to determine a country's energy needs and the main options for meeting them, while also respecting priorities such as access, security, climate goals and environmental protection.

In practice, good energy planning usually follows a clear sequence of steps: bringing the relevant stakeholders together, forming a leadership team, agreeing on a shared vision, analysing the current energy situation, setting goals, comparing and ranking different policy and program options, identifying funding, compiling the plan, and then regularly measuring results and revising the plan. This kind of orderly process is very different from ad hoc, reactive policy, where problems are addressed only when they become urgent. Instead, strategic planning looks ahead over 15–25 years, sets measurable targets, tracks progress against initial baselines, involves stakeholders in a sustained way, and systematically weighs different future energy scenarios before choices are made.

III. PESTEL Analysis of Bulgaria's Energy Environment

- **Political Factors**

  Bulgaria's energy policy is deeply shaped by its political environment. As an EU member, the country is formally committed to ambitious climate and environmental goals, including cutting emissions by 55% compared to 1990 levels by 2030, expanding renewables and gradually phasing out coal. In practice, however, domestic politics often pull in the opposite direction. Parties are wary of setting firm coal exit dates because of fears about jobs in coal regions, and in early 2023 Parliament even removed interim coal-reduction milestones from the Recovery Plan, effectively keeping all coal plants running until 2038 and putting significant EU funding at risk.

  External politics add another layer of complexity. Bulgaria's long-standing reliance on Russian gas, nuclear technology and fuel has been upended by the war in Ukraine and the sanctions that followed. This has forced the country to look for new partners, such as Azerbaijan or Qatar, and to adapt to a broader European shift from a purely market-driven approach to one where security of supply plays a central role. At the same time, internal political instability – frequent elections, fragile coalitions and clashing ministerial interests – makes it difficult to sustain a clear long-term line. Trade unions in the coal sector both resist rapid closures and talk about jobs in renewables, adding to the mixed signals that leave local communities unsure what to expect and when.

- **Economic Factors**

  Economic issues play a central role in Bulgaria's energy transition. Keeping electricity affordable is a key political and social priority, so the state uses price caps to shield households. This protects vulnerable consumers but also distorts market signals and makes it harder to attract investment and encourage efficiency. Given that Bulgaria is the poorest EU member, even modest price increases can have serious social consequences, forcing policymakers to constantly balance three goals at once: keeping energy cheap, guaranteeing security of supply and cutting emissions.

  On top of that, the scale of investment needed is huge. Moving away from coal towards renewables, and upgrading grids, storage and demand-side infrastructure, will cost many billions of dollars over the next decade, far more than public funds alone can cover. EU money helps, but long-term private capital is indispensable, and this is exactly what is scared off by unpredictable regulation and measures such as retroactive windfall taxes. Broader economic trends also matter: the post-COVID slowdown temporarily eased demand and allowed more exports, but future growth and any expansion of energy-intensive industry will push consumption back up. Demographic

decline and emigration dampen this growth somewhat, buying a bit of time. Finally, global moves towards reshoring and "friend-shoring" raise equipment costs and may erode competitiveness, yet they could also open space for Bulgarian firms to join emerging European supply chains in the renewables sector.

- **Social Factors**

Coal is not just an energy source in Bulgaria; it is a major employer in a few specific regions, where mines and coal-fired power plants provide jobs for more than 13,000 people. Phasing coal out too quickly, without first creating new jobs and alternative economic activities, would hit these areas hard and could trigger serious social crises. At the same time, postponing the transition makes it harder to retrain workers and diversify local economies in an orderly way. Public attitudes are also mixed: a clear majority of Bulgarians say they support ending coal use by 2030 for environmental reasons, but people whose livelihoods depend on coal often oppose concrete measures that threaten their income here and now.

Another problem is that society is not fully engaged in the energy debate. The choices that have to be made – between price, security and environmental protection – are complex and require an informed public and active participation from different groups. Instead, communication from institutions is often weak, and citizen involvement in energy planning is limited, which makes it difficult to build broad agreement on long-term decisions. Demographics add a further twist: Bulgaria's population is shrinking and ageing because of low birth rates and ongoing emigration. This slows down overall growth in energy demand, but older and vulnerable people may need more heating and cooling support, raising important questions of fairness and social protection in energy policy.

- **Technological Factors**

From a technological point of view, Bulgaria's energy transition rests on several important trends. The first is the rapid maturing of renewable technologies. Solar power has become cheap enough that new projects can be built without relying on subsidies, a clear break from the earlier feed-in-tariff era. Wind energy is also becoming competitive, although its development in Bulgaria still trails behind solar.

A second key element is storage. Falling battery prices mean that large, grid-scale storage is no longer just a theoretical option, and the dozens of planned projects in the country suggest that the technology is ready for broader use. At the same time, questions about what happens to batteries at the end of their life cycle are becoming more urgent, as proper recycling and waste management systems are needed. Nuclear technology adds another layer of complexity: existing reactors are based on Russian designs and fuel, which limits flexibility, while new concepts such as small modular reactors are promising but not yet commercially mature. Finally, modernizing and digitalizing the grid – for example through smart systems for balancing and forecasting – is essential to integrate growing shares of variable renewables without having to massively expand traditional transmission infrastructure.

- **Environmental Factors**

From an environmental point of view, Bulgaria's energy policy is under growing pressure. Hotter summers are pushing up demand for cooling, shifting rainfall patterns are making hydropower output less predictable, and more frequent extreme weather puts energy infrastructure at greater risk. These effects mean that, alongside cutting emissions, the system also has to adapt to a changing climate.

Air pollution is another powerful driver of change. Bulgarian coal plants are among the dirtiest in Europe, contributing to premature deaths and widespread respiratory illness, so stricter EU air quality rules increasingly limit how long they can operate, regardless of climate targets. On top of this, the country's own resource base is changing: coal reserves will not last indefinitely even without climate policy, and most viable hydropower sites are already in use. By contrast, Bulgaria's solar and wind potential is still far from fully exploited, which makes them central to any long-term sustainable energy strategy.

- **Legal Factors**

From a legal standpoint, Bulgaria's energy policy is strongly framed by EU rules. A dense package of European laws – on energy efficiency, renewables, emissions trading and other sectors – sets binding targets and standards, which Bulgaria has to translate into its own legislation and reflect in its National Energy and Climate Plans.

At national level, the picture is more uneven. Earlier laws encouraged renewables, but the legal framework has since evolved in a piecemeal way: some acts need updating to properly regulate the coal phase-out and introduce emission caps, while temporary measures like the 2022 windfall tax were brought in to handle the energy price crisis. For investors, the biggest concern is that the rules of the game can change after the fact. Retroactive decisions, unclear interpretation of regulations and politically driven interventions all create uncertainty and make long-term projects riskier. A more stable and predictable regulatory environment is therefore essential if Bulgaria is to attract the private capital needed for its energy transition.

IV. Generalizable Framework for Energy-Import-Dependent Nations

Bulgaria's experience offers valuable insights into how energy-import-dependent countries can design strategic plans for long-term security and transition management.

Systematic strategic planning

For countries seeking stable energy futures, ad hoc crisis responses are not enough. Effective governance requires structured, forward-looking strategies. A nine-step approach—starting with stakeholder engagement and leadership setup, followed by defining a vision, assessing the current situation, setting goals, evaluating options, securing funding, developing the plan, and establishing monitoring mechanisms—provides a useful model that can be tailored to different national settings. The method's application, however, should fit each country's institutional culture: centralized systems benefit from top-down coordination, while federations often rely on bottom-up input and aggregation.

Ensuring policy coherence

The success of any energy strategy ultimately depends on consistency across policy areas, government layers, and time horizons. To achieve that, governments should set up coordination structures such as inter-ministerial committees to prevent conflicting policies, impact assessment processes to track cross-sector effects, and periodic reviews to identify contradictions. Of key importance is the alignment between energy security objectives and climate commitments, a relationship that often poses challenges but can be managed through thoughtful institutional design.

Treating just transition as a core element

Every energy transition has social and economic consequences, particularly for regions that depend on declining fossil industries. A just transition should therefore be embedded from the very beginning of the planning process, not added as an afterthought. This means engaging with affected communities early on, conducting detailed assessments of socioeconomic impacts, funding support programs well before closures occur, encouraging local economic diversification, and ensuring that planning includes meaningful participation from those most directly affected.

Accounting for geopolitical risks

Modern energy security planning cannot ignore geopolitics. Beyond technological and economic aspects, strategies must assess exposure to geopolitical risks. This involves diversifying energy import sources and routes, reinforcing critical infrastructure against physical and cyber threats, maintaining strategic reserves, and prioritizing supply relationships with reliable partners—a concept now often described as "friendshoring." Still, protectionist excesses should be avoided, as they tend to increase costs and reduce efficiency.

Managing adaptively amid uncertainty

Energy transitions unfold under deep uncertainty involving technological change, price volatility, climate impacts, and global political shifts. Rather than relying on a single rigid forecast, effective plans test multiple future scenarios. They include triggers for updating policies when conditions change, encourage flexible investment choices, and promote continuous learning through periodic review. Updating plans in light of new evidence is a sign of resilience, not weakness.

Focusing on implementation and monitoring

Even the most elegant strategy means little without strong execution. Effective implementation depends on clearly defined institutional responsibilities, sufficient resources, technical expertise, and transparent monitoring systems. Regular evaluations should track real-world impacts, identify lessons learned, and prompt timely course corrections. Monitoring should aim not just to ensure compliance but to drive continuous improvement over time.

IV. RESULTS AND DISCUSSION

The article explores how strategic planning frameworks can guide energy-import-dependent countries—such as Bulgaria—through the complex process of achieving energy security while fulfilling decarbonization commitments and managing geopolitical uncertainty. Using Bulgaria as a case study, it demonstrates how integrating systematic planning tools such as PESTEL analyses, stakeholder consultations, and ongoing monitoring can help policymakers make informed tradeoffs between security, affordability, and sustainability.

Bulgaria faces a particularly intricate challenge. As it phases out coal-fired power plants, the country must confront job losses in coal-dependent regions while simultaneously expanding renewable capacity, upgrading transmission infrastructure, diversifying its energy imports, and keeping electricity costs manageable for households. These competing priorities demand careful coordination rather than reactive crisis management. Strategic planning creates structure in this environment, guiding deliberate decisions that balance short-term limitations with long-term goals.

The study identifies several key conditions for success. First, policy coherence is vital. Energy and climate policies must align horizontally across institutions and vertically across time horizons to avoid conflicting objectives. Fragmented policymaking—where energy security efforts undermine decarbonization goals, or vice versa—risks paralyzing both agendas. Second, planning for a just transition must begin early. Economic diversification, retraining, and social support programs should be initiated well before coal closures to ensure affected communities are not left behind. Third, energy planning must explicitly account for geopolitical risk, recognizing that global competition increasingly shapes energy access and security. Fourth, adaptive management and robust monitoring systems allow governments to adjust strategies dynamically as technological, political, and market conditions evolve.

Another crucial trend examined is the movement toward "friendshoring"—prioritizing energy relationships with trusted allies rather than simply seeking the lowest-cost suppliers. For Bulgaria, this marks a departure from decades of market liberalization but also offers potential advantages through more stable partnerships and access to allied financing. However, such an approach requires nuanced planning to avoid excessive cost burdens while ensuring reliable supply chains.

Ultimately, the paper argues that Bulgaria's successful energy transition hinges on political clarity and decisive commitment. The country cannot pursue both coal retention and renewable expansion indefinitely. Establishing a transparent coal phase-out timeline, coupled with well-funded just transition measures and accelerated renewable investments, is essential for real energy security.

From a broader scholarly perspective, the analysis bridges strategic planning theory and energy policy practice, demonstrating the value of public administration frameworks in managing sectoral transformations. The article concludes by calling for comparative research on implementation effectiveness, adaptability, and participatory planning across different national contexts. As the global energy landscape grows more uncertain, systematic strategic planning emerges as not only a technical necessity but also a cornerstone of coherent and sustainable public governance.

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