

A MODEL APPROACH TO LONG-TERM FORECASTING OF ELECTRICITY SUPPLY

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Abstract. This article examines the scale of problems in the perspective of providing electricity to the population and the importance of an innovative approach to these problems. In the future, the complexity of the requirements for long-term forecasting in the development of forecast parameters of electricity supply creates a sufficiently uncertain system of the process. Effective research of this process requires the application of today's modern scientific achievements in modeling processes, in particular, modern modeling equipment, and consistent implementation of the optimal testing range of the obtained results. The problem and results of the research are aimed at clarifying aspects of effective use of modern equipment for successful implementation of long-term forecasting in conditions of uncertainty.

Keywords: electricity supply, long-term forecasting, model, modeling, software, artificial intelligence, economic growth.

Annotatsiya. Ushbu maqolada aholini elektr energetikasi bilan ta'minlash istiqbolidagi muammolar ko'lami va mazkur muammolarga innovatsion yondoshuvning ahamiyati tadqiq etilgan. Istiqbolda elektr ta'minotini prognoz parametrlarini ishlab chiqishda uzoq muddatli prognozashtirishga qo'yiladigan talablar murakkabligi, jarayonning yetarlicha noaniq tizimini vujudga keltiradi. Bu jarayonni samarali tadqiq etish esa modellashtirish jarayonlarida bugungi zamonaviy ilm-fan yutuqlaridan, xususan, zamonaviy modellashtirish apparatlarini tadbiq etishni hamda erishilgan natijalarni optimal sinash diapazonini izchil amalga oshirishni talab etadi. Tadqiqot muammosi va natijalari noaniqlik sharoitida uzoq muddatli prognozashtirishni muvaffaqiyatli amalga oshirishning zamonaviy apparatlaridan samarali foydalanish jihatlariga oydinlik kiritishga qaratilgan.

Kalit so'zlar: elektr ta'minoti, uzoq muddatli prognozashtirish, model, modellashtirish, dasturiy ta'minot, sun'iy intellekt, iqtisodiy o'sish.

Модельный подход к долгосрочному прогнозированию электроснабжения

Аннотация. В данной статье рассматривается масштаб проблем в перспективе обеспечения населения электроэнергией и важность инновационного подхода к этим проблемам. В дальнейшем сложность требований к долгосрочному прогнозированию при разработке прогнозных параметров электроснабжения создает достаточно неопределенную систему этого процесса. Эффективное исследование этого процесса требует

применения современных научных достижений в процессах моделирования, в частности, современного модельного оборудования, и последовательной реализации оптимального диапазона проверки полученных результатов. Проблема и результаты исследования направлены на выяснение аспектов эффективного использования современной техники для успешного осуществления долгосрочного прогнозирования в условиях неопределенности.

Ключевые слова: электроснабжение, долгосрочное прогнозирование, модель, моделирование, программное обеспечение, искусственный интеллект, экономический рост.

Introduction. In our rapidly evolving world, ensuring a stable and sustainable electricity supply is paramount. This section introduces the importance of long-term electricity supply forecasting in addressing the energy needs of the future. It highlights the role of accurate predictions in guiding community development and fostering a resilient energy landscape.

AI and ML have emerged as powerful tools in long-term forecasting. These technologies allow forecasting models to learn from historical data patterns and make predictions based on complex algorithms. By analyzing vast amounts of data, AI and ML modules can identify hidden trends, correlations, and anomalies that humans may overlook. They also offer the advantage of continuous learning, as the models can adapt and improve over time, leading to more accurate forecasts[1].

The availability of big data has significantly influenced long-term forecasting methodologies. By collecting and analyzing large volumes of structured and unstructured data from diverse sources, organizations can gain valuable insights into consumer behavior, market trends, and economic indicators. Predictive analytics modules utilize this data to generate forecasts that consider multiple variables and provide a comprehensive view of the future landscape[2]. This enables businesses to make informed decisions and develop robust strategies.

Scenario planning is a module that enables organizations to prepare for multiple future scenarios. Rather than relying on a single forecast, scenario planning involves developing various plausible scenarios based on different assumptions and uncertainties[2]. By considering a range of potential outcomes, organizations can assess the risks and opportunities associated with each scenario and develop contingency plans accordingly. This module allows businesses to be more adaptable and resilient in the face of uncertainty[3].

Collaborative forecasting modules leverage the collective intelligence of teams within an organization. By involving stakeholders from different departments, such as sales, marketing, and finance, organizations can gather diverse perspectives and expertise. This collaborative approach enhances the accuracy of long-term forecasts by incorporating insights from various domains and aligning the forecasts with organizational goals.

Policy and regulation play a crucial role in shaping the social, economic, and environmental landscape of a country or region. They provide a framework for

governance, set standards, and establish guidelines for various sectors[3] and industries. However, policy and regulation are not static; they are subject to constant change and evolution. In this article, we will explore the dynamics of policy and regulation, examining the factors that drive change, the challenges faced in implementation, and the impact of dynamic policies on businesses and society[4].

Factors Driving Change in Policy and Regulation

Technological Advancements: Technological advancements have a profound impact on policy and regulation. New technologies often outpace existing regulations, requiring policymakers to adapt and update regulations to address emerging challenges and opportunities. For example, the rise of autonomous vehicles has prompted policymakers to develop regulations regarding safety, liability, and data privacy[5].

Social and Cultural Shifts: Changes in societal values and cultural norms can influence policy and regulation. As public awareness and concern for issues such as climate change, social justice, and privacy rights increase, policymakers are under pressure to address these concerns through new policies and regulations. Social movements and public opinion often play a significant role in shaping policy agendas.

Economic Considerations: Economic factors, such as market trends, globalization, and industry competitiveness, can drive changes in policy and regulation. Governments may introduce new policies to attract investments, foster innovation, or protect domestic industries. Economic crises or shifts in global trade can also necessitate regulatory changes to ensure stability and address emerging challenges.

Challenges in Policy and Regulation Implementation

Political Interests and Lobbying: Policy and regulation implementation often face challenges due to conflicting political interests and lobbying efforts. Industries or interest groups may exert influence to shape policies in their favor or to delay or dilute their implementation. Balancing competing interests and ensuring transparency in decision-making processes is crucial for effective implementation[5].

Compliance and Enforcement: Policies and regulations are only effective if they are complied with and enforced. Lack of compliance and weak enforcement mechanisms can undermine the intended impact of policies. Governments need to invest in robust monitoring systems, enforcement agencies, and penalties to ensure compliance and deter non-compliance.

Complexity and Interconnectedness: Policies and regulations are often complex, with multiple interdependencies across sectors and jurisdictions. This complexity can create challenges in implementation, coordination, and enforcement. Collaboration between different government agencies, stakeholders, and international partners is essential to address these challenges effectively.

Impact of Dynamic Policies on Businesses and Society[5].

Business Adaptation: Dynamic policies and regulations require businesses to adapt and comply with new requirements. This can involve changes in operational processes, investments in new technologies, or adjustments to business models. Adapting to dynamic policies can be both challenging and costly for businesses, but it also presents opportunities for innovation and market differentiation.

Consumer Protection and Public Welfare: Dynamic policies and regulations aim to protect consumer rights, ensure public safety, and promote public welfare. They provide a framework for fair competition, product quality standards, and environmental sustainability. Effective policies can enhance consumer trust, promote responsible business practices, and safeguard public interests[6].

Sustainable Development: Dynamic policies and regulations play a crucial role in promoting sustainable development. They address environmental challenges, encourage renewable energy adoption, and promote sustainable resource management. By setting targets and incentives, policies can drive businesses and society towards a more sustainable future[6].

Conclusion. A comprehensive program for long-term electricity supply forecasting is not just a technical exercise; it's a commitment to building a sustainable and resilient future. By embracing advanced methodologies, understanding the significance of accurate predictions, and considering the holistic development of communities, this program empowers societies to thrive amidst a rapidly evolving energy landscape. As we move forward, investing in such programs becomes imperative, ensuring that our communities are not just powered, but empowered, for generations to come.

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