



# Iraq Economic Review

**The Economy in an Era of Climate Change**

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# Scaling Up Iraq's Energy Transition: Is Now the Right Time?

*Maha Yassin*



Solar power project at the Faihaa oil field in Basra. September 11, 2022. Source: Reuters

## Introduction

Every year, the local government in Basra gives public sector employees a “heat holiday” when temperatures hit or exceed 50 degrees Celsius, an approach that has been adopted by other cities across the country. This policy is designed to make summer months more tolerable for government workers, but it only offers limited comfort. By staying at home, the employees endure long hours of power outages and increased air and noise pollution from privately operated, diesel generators. Iraq is expected to experience a growing number of these high-temperature days in the coming years. It is imperative that the country explore renewable energy solutions such as solar power. Yet, the road ahead is complicated.

Although wind and hydropower energy resources are viable renewable energy options in Iraq, the country holds particular advantages with regard to solar energy. The country receives an average [irradiation of 5.6 kWh per square meter per day and over 3,000 hours of sunshine](#) per year. Yet, it is far-fetched to expect Iraq will make a major turn towards renewables in the near future, but this does not mean that progress cannot be made. The state should take concrete steps by investing in relevant infrastructure, strengthening its policy framework regarding financing for solar power projects, and overcoming technical and political impediments.

Twenty years after the fall of the Ba'athist regime, Iraq's energy sector continues to fall short of both growing demand and the ambitions of successive governments to improve capacity. Power outages and dependence on fossil fuels have only increased and the supply-demand gap has only grown. In 2023, the country's power plants produced around [24,000 MW](#), which is far less than the estimated [34,000 MW](#) needed to cover domestic demand. Iraq currently relies on natural gas imports from Iran and power transmissions from other neighboring countries to [offset the shortfall](#). By 2030, however, power demand is [expected to double](#) because of population and economic growth. In hopes of addressing this challenge and becoming more self-reliant, Iraq has plans for new [projects to exploit](#) its natural gas resources. However, investing in a transition to solar energy is another crucial part of a holistic strategy that will contribute to Iraq's economic development, stability, and deduction of environmental pollution. This paper explores how the country can harness the potential of the emerging renewable energy industry and amplify Iraq's transition efforts.

## Why transition to renewable energy?

Over the last two decades, long and frequent power outages have been a major factor in [insecurity in Iraq](#). Compounded by extreme heatwaves and halting political progress, energy shortfalls sparked protests in different parts of the country.



**Investing in renewable energy solutions will help Iraq to meet its Nationally Determined Contributions (NDCs) under the Paris Agreement, but also improve the lives of its citizens for generations to come.**

In some cases, the demonstrations escalated into [violent clashes](#) and even forced the government of former prime minister Adil Abdul-Mahdi to [resign](#)

during the Tishreen protests in 2019. But shifting to renewable energy goes beyond merely bolstering stability and economic development.

Venturing into renewable solutions would provide some environmental relief by curbing carbon emissions. More than [80% of electricity](#) generated in Iraq comes from fossil fuel sources. Despite [efforts to capture natural gas](#), Iraq still flares [billions of cubic meters](#) every year, making it the [second-largest source of gas flaring](#) worldwide after Russia. Yet, even if Iraq diverted all its natural gas resources to power generation, carbon emissions would remain a big source of environmental pollution. Privately operated diesel generators are a major contributor in this regard.

Carbon emissions result in myriad health and environmental problems in Iraq, especially in the southern provinces where reports have documented an [increase in health issues](#). Cases of asthma, hypertension, and [cancers like leukaemia](#) are all linked to chemicals present in fossil fuels that are polluting the air, land, and water. Therefore, investing in renewable energy solutions will help Iraq to meet its [Nationally Determined Contributions](#) (NDCs) under the Paris Agreement, but also improve the lives of its citizens for generations to come.

## Ambitious policies and flawed execution

Iraq has suffered from energy shortages since the early 1990s because of wars, sanctions, and outdated infrastructure. After 2003, the new government promised to rebuild the electricity sector, and increase its capacity, which was welcomed with great optimism by the public. Since 2008, Iraq has signed several contracts and memoranda of understanding with prominent energy companies such as [Siemens and General Electric](#). The Ministry of Electricity has also signed agreements with [Saudi](#) and [Emirati](#) investors to develop sources of renewable energy. However, progress on these initiatives is hampered by corruption and political tensions, which result in significant delays.

It seems that the government has yet to grasp the urgency of implementing concrete climate adaptation and mitigation policies that incorporate renewable energy solutions. As part of its commitments under the Paris Agreement, Iraq has pledged to reduce gas flaring and improve renewable technologies. Yet, its ambitions for a sustainable, green transition have mostly been limited to formalities, including signing agreements with [major renewable energy developers](#). However, there are signs on the ground that more tangible efforts and investments are starting to happen.

For example, Iraq worked with a [UNDP-supported pilot project](#) between 2014 and 2020 to assist the growth of public and private Independent Power Producers (IPP) initiatives by building their capabilities and organizational structures. During that time, UNDP and its partners provided legal, technical, and policy revisions to address possible barriers to building renewable energy projects. In 2021, the Central Bank of Iraq (CBI) launched the \$685 million [Renewable Energy Transformation Initiative](#). It is a [framework](#) for financing clean energy projects that covers individuals, small businesses, municipalities, and investors in order to strengthen Iraq's climate resilience and combat environmental degradation.

It will take several years for the CBI initiative to bear fruit. More time is needed to raise awareness among the public about the long-term benefits of shifting to clean energy. Most of the obstacles that remain are either political or structural in nature, according to Basima Abdulrahman. She is the founder of [KESK](#), a green solutions company based in Erbil. Entrepreneurial efforts in the renewable energy sector face tedious bureaucratic processes that greatly reduce interest in pursuing CBI subsidies. Abdulrahman explained in an interview: "We frequently inform our customers about the CBI initiative and the advantages it offers if they want our reliable services. However, they often opt out due to the complexities of the process and mistrust in the loaning system, resulting in customer attrition."

She also said it was risky to rely on newly introduced policies because they often change when different political leadership, objectives, and priorities are put in place.



**Entrepreneurial efforts in the renewable energy sector face tedious bureaucratic processes that greatly reduce interest in pursuing CBI subsidies.**

Entrepreneurs also struggle with unregulated markets and pricing strategies. For example, a specialized company like KESK provides consultations to businesses interested in installing solar power systems. It also designs and supplies solar-powered air conditioning systems to international organizations working in Iraq. However, KESK frequently encounters problems when potential customers find non-certified service providers that offer low-quality solar power systems. According to Abdulrahman, unspecialized businesses pose a significant challenge to her young company because she is unable to match their lower prices.

## Who is in the field now?

International aid organizations, development institutions, and foreign governments have been at the forefront of financing and implementing small-scale renewable energy projects in Iraq. Institutions including the World Bank Group, GIZ, UNDP, USAID, and the Iraq Reform, Recovery and Reconstruction Fund (I3RF) have collaborated with Iraq's federal government and the Kurdistan Regional Government (KRG) to strengthen the microfinance sector. This involves the development of a grant system to catalyze private investment in local start-ups, including those in the renewable energy sector.



Installation of an off-grid wall mounted solar PV system in Chamchamal, Sulaymaniyah, 2021. Source: KESK

However, these efforts are facilitated primarily by the humanitarian sector. International organizations have focused on supporting communities in northern Iraq that host internally displaced persons (IDPs) in remote villages and IDPs who return to their home communities. For instance, [Welthungerhilfe supports](#) approximately 14,000 smallholder farmers in Nineveh governorate through its solar power project, giving them sustainable access to electricity, cold storage units, running water, and solar-powered irrigation systems. Additionally, the UNDP renewables project delivers support to farmers through [solar-powered irrigation wells](#). This helps them transition to sustainable agricultural practices as they recover from the conflict with the so-called Islamic State of Iraq and al-Sham (ISIS).

Nashwan Dahir, Iraq Country Manager of the International Centre for Water and sanitation ([CEWAS](#)), a water entrepreneurship consultancy, explained that microfinancing schemes are vital to reinforcing stability in Iraq. However, the country's growing renewable energy sector requires more than just finance and infrastructure, he said. To be more effective, relevant organizations should expand their geographic scope beyond areas impacted by ISIS and support a wider array of businesses in diverse sectors. Moreover, the Iraqi government must work

with its international partners to develop technical expertise, provide educational initiatives, and support research and innovation.

Entrepreneurial enterprises that promote renewable energy regularly encounter a high degree of business uncertainty and social resistance. Many individuals and businesses are reluctant to replace their diesel generators with solar power systems. They believe that fossil fuels will be accessible forever. A middle-income household might spend between \$50 and \$100 per month on private diesel generators in their neighborhoods, which does not cover supplementary maintenance costs. They are also charged for the electricity that they receive from the public power grid. Installing a solar power system for domestic use costs between [\\$3,000 to \\$20,000](#) depending on its type and size. Therefore, it is important to raise public awareness through various communication channels in order to encourage demand for renewable systems. Ali Sadiq, a resident of Basra governorate, said that he recently spent \$2,500 on a used diesel generator, but continues to pay approximately \$90 per month for services from the neighborhood generator. He explained that relying solely on a single power source is risky, particularly when temperatures reach 50 degrees Celsius and the public grid goes down for long



periods. When asked whether he would use a solar power system at home instead of fossil fuel generators, Sadiq said that he is aware of the environmental advantages and the long-term financial benefits of switching, but raised concerns about the efficiency of solar panels due to the frequent sand and dust storms that sweep across Iraq. The accumulation of particles can decrease the effectiveness of photovoltaic panels by as much as [30% within a single month](#). The Ministry of Environment anticipates [272 days of dusty conditions per year](#) over the next two years. This presents a substantial challenge for marketing any new solar project.

## Navigating beyond policy formalities

Going beyond regional agreements and vague policy goals and instead announcing funding initiatives would be a major step for the development of Iraq's renewable energy sector. Both additional funding and comprehensive strategies are needed to meet the ambitious target of [generating 12,000 MW](#) of renewable energy by 2030, when energy demand is expected to [double](#). This is about a third of the country's total electricity production. However, Iraq appears unlikely to reach even half of this target, given the lack of investment. The recently passed three-year federal budget includes just one line specifically for renewable energy, a \$200 million allocation to build a solar energy project. This new facility is [expected](#) to have a capacity of 750 MW.

Therefore, both radical reforms and political vision from a committed leadership are needed to facilitate the transition to renewable energy. It will take years to rebuild the country's overall energy sector, but Iraq must seize the opportunity provided by the currently stable security environment and accelerate its efforts to build renewable energy projects. Facilitating international investment to empower and finance micro-projects could be the way forward if Iraq plans to adhere to its NDCs and economic growth strategies.

A first step is to build local demand for clean energy

solutions. Leading by example, the government should start with its own institutions by ordering ministries and directorates to monitor their carbon footprint and make use of funding opportunities offered by the CBI to transition to renewables. The current policy, which runs until 2030, [targets](#) only 20% of government entities. This initiative should be paired with an extensive public awareness campaign to motivate individuals and businesses to consider switching to clean energy solutions. This effort could face resistance on the basis that fossil fuels are readily available and cheap compared with solar power systems. The campaign should, therefore, focus on showing the harmful environmental impact of diesel generators and gas-operated power plants as a way to persuade consumers to switch.



**Both radical reforms and political vision from a committed leadership are needed to facilitate the transition to renewable energy. It will take years to rebuild the country's overall energy sector, but Iraq must seize the opportunity provided by the currently stable security environment and accelerate its efforts to build renewable energy projects.**

Furthermore, solar power systems remain relatively expensive for the average consumer, so the CBI and Iraqi banks should provide favorable loans to help install and maintain them. This could also help boost employment at local enterprises that work on renewables. In this regard, it is a mutually beneficial outcome.

Ultimately, as the climate crisis tightens its grip on Iraq, the urgency of diversifying its energy sector by increasing the use of renewable energy is greater than ever before. Reflecting on the challenges that her business encounters, Abdulrahman said, "It has been a rollercoaster since we embarked on our journey, but I perceive transitioning to renewable energy in Iraq as an imperative need, not a luxury."

# The Underbelly of Iraq's 'Economic Boom'

Hayder Al-Shakeri

## Introduction

Dijlah Village, a sprawling 6,000-square-meter [complex](#) boasting restaurants, high-end meeting rooms, and a health center, opened in Baghdad in summer 2022. It sits on the banks of the Tigris River, where a fountain show takes place every half-hour to a soundtrack of Arabic pop hits. Iraqi political elites and their associates use it to showcase how far the country has come.

The glamour of the luxury development, however, is not enough to hide the glow of the gas flare from the Dora Oil Refinery [visible](#) on the other side of the river. As diners pose for photos in front of the fountain, the refinery behind them spews toxic gases, poisoning people and the planet, while also flaring off precious fuel that could be used to provide electricity for ordinary Iraqis. This poignant contrast raises questions about where investments are being made, by whom, and for whose benefit.



**Most ordinary enterprises are forced to navigate an economic system dominated by Iraq's powerful and wealthy political parties.**

Not all businesses have the enormous capital that makes Dijlah Village possible. Most ordinary enterprises are forced to navigate an economic system dominated by Iraq's powerful and wealthy political parties. Drawing on interviews with owners and employees at small and medium-sized businesses, this paper explores the strategies that enable such companies to survive and generate capital. If Iraq's current economic boom is to avoid an eventual bust, the government and multilateral organizations

must develop ways to support such enterprises and remove the many barriers that prevent their growth.

## Explosion of investment

In recent years, Iraq's political elite and their business associates have preferred to invest their wealth in local projects as a safe haven for ill-gotten gains. This money is made from state coffers. Under the ethno-sectarian apportionment system [implemented](#) after 2003, the dominant political parties meet following each election for negotiations to divide up control of government ministries and their corresponding assets. Each major political party controls one or more ministries. As a result, the distribution of lucrative government contracts is heavily [influenced](#) by partisan interests. "Economic committees" staffed by party members review ministerial contracts and require a commission to sign off on any deal.

In part to disguise the origins of their illegally obtained funds, the political elite have allegedly taken to investing in upscale residential compounds, malls, private universities, and other real estate ventures, resulting in a "visible boom" in Baghdad's [development](#). However, many of these projects are inaccessible to ordinary Iraqis, who experience numerous economic difficulties. To illustrate, pursuing a dentistry degree at a private Iraqi university [costs](#) around \$6,000 per year, whereas a meal in Dijlah Village costs an [average](#) of 30,000 IQD (around \$20) per plate. These expenses starkly contrast with the average monthly [salary](#) in Iraq of just \$583.

Increasingly, the political elite [opt to invest](#) in local projects because of growing restrictions on moving

money out of Iraq. Moreover, high oil prices led the Iraqi parliament [to approve](#) a budget of \$153 billion for 2023, a record amount. This increases the political elites' access to public money.

A recent Washington Post [report](#) indicated that these investments provide a way for the elite to launder money acquired from state entities and government contract manipulation. Some citizens initially appreciated that they were at least getting to enjoy a wider variety of malls and restaurants after many years of insecurity. But attitudes are changing and, increasingly, ordinary Iraqis are starting to see that they are the ones who bear the brunt of rising prices for essential goods and services. As a consequence of the enormous influx of investment into Iraq's real estate sector, the cost for a single square meter of land in Baghdad, even without access to basic utilities like electricity and water, now [exceeds](#) \$2,300.

## Navigating the system

Smaller businesses, including delivery services, restaurants, or niche tech-related services, may manage to operate a successful enterprise without significant interference from party officials. Many do not directly compete with or threaten the political elite's interests, allowing them to operate relatively freely, as long as they successfully navigate Iraq's infamous bureaucracy. However, once a business gains a noticeable profile, it will typically start to attract the attention of the political elite. After that, representatives of parties or armed groups will seek to join the business, offer "protection," or simply take over the enterprise, explained one business owner interviewed for this article.

In a troubling development, however, the political elite is increasingly using its resources and power to assert control over smaller businesses, which creates new challenges for entrepreneurs. A restaurant owner

in Baghdad said that "I am already paying bribes to keep my restaurant afloat. When I attempted to expand, I encountered political obstacles that made me reconsider. I chose to abandon the idea, as I am unwilling to be entangled with such associations."



**If Iraq's current economic boom is to avoid an eventual bust, the government and multilateral organizations must develop ways to support such enterprises and remove the many barriers that prevent their growth.**



An aerial view of Baghdad, Iraq, August 11, 2021. Source: Reuters

Striking a delicate balance between achieving business success and avoiding unnecessary attention from political parties means walking a tightrope. Businesses in Iraq must tread carefully to navigate the complexities of the political landscape and safeguard their operations while pursuing growth and profitability. Negotiating the intricate landscape of starting and maintaining a business in Iraq requires a keen understanding of the prevailing political dynamics.

## Immense challenges facing businesses

Small and relatively independent companies face immense challenges in acquiring contracts and deals, in contrast to party-connected entities. Business owners interviewed for this paper said that bureaucracy, government indecision, and the unpredictable economic environment pose significant [challenges](#) for their ventures. From company registration and tax payments to dealing with customs and logistics, each administrative process is accompanied by its own set of challenges. For example, one interviewee who manages a tech startup said that “the government’s inconsistent decisions can greatly impact businesses, especially in sectors that require frequent government interactions.” Another entrepreneur who has worked with multiple companies said that “when you start doing business in Iraq, it’s not easy. There’s much bureaucracy. You need to figure out who holds the power and influence in different sectors. Knowing who to talk to and who to bribe becomes almost essential. It’s unfortunate, but sometimes, paying bribes or cutting political deals seems like the only way to get things done efficiently.”

Even for powerful international commercial entities operating in Iraq, deals often fall through due to bureaucratic obstacles and endless political interference. A notable recent [example](#) is “Al-Rafeel City,” which involved the construction of an

administrative complex on the outskirts of Baghdad to house government ministries. While the reputable Emirati company Emaar was [selected](#) by the Council of Ministers to carry out the project, political interference and demands for bribes ultimately led to the project’s failure. Such practices deter foreign investment and irritate partners. The Emirati ambassador to Iraq had previously raised [concerns](#) about corruption in Iraq’s business landscape. Although efforts have been made to streamline and simplify government and bureaucratic procedures, substantial improvements are still needed in order to make the business environment easier to navigate. Indeed, according to the latest World Bank “Doing Business” report, Iraq [ranks](#) 172 out of 190 countries in terms of ease of doing business.

## Strategies

Interviews with business owners pointed to various strategies that have emerged in response to Iraq’s complex business environment. One approach is to adhere strictly to bureaucratic protocols when establishing a business, which is a challenging yet attainable feat. Under this approach, business owners register their companies, pay their taxes and follow all the rules like they would do in any other country. However, this path often leads to encounters with political entities, armed groups, or their associates who seek involvement in the business. Once faced with those actors, businesses are presented with limited choices: resist and face potential consequences, shut down operations and incur losses, or opt for the seemingly more straightforward route of cooperation with these entities.

The experience of one of Iraq’s e-commerce businesses illustrates this choice. The business has been running for many years, expanding slowly with private investments from both inside and outside Iraq. However, due to bureaucratic hurdles, the volatile political and security landscape, and global economic challenges following the Covid-19 pandemic and the Ukraine crisis, some investors chose to withdraw their support. It came at

a bad time, as the business had just expanded, which rendered its operations unsustainable. After a period of struggle, the business had to accept investments from companies and individuals who are connected to Iraq's political elite in order to continue operations. Tragically, for many companies, the only workable solution is to play within the parameters of the party-dominated economic system by working with a politically connected agent. These partnerships facilitate relationships with the political elite and ensure smooth business operations. The chosen partner may be a political party or a party-aligned individual or business. This either leads to full alignment with the partner's interests or the partner acts as a broker that navigates the system on behalf of the business. These partnerships not only facilitate bureaucratic processes but also provide a degree of protection from undue political pressure.

One example of this dynamic involves an international ridesharing company that began operations in Iraq a few years ago. Before launching, they took proactive measures to establish close ties with firms with well-established political affiliations and connections within the bureaucratic framework. This strategic decision was designed to ensure their ongoing presence and business growth in Iraq. Indeed, it was an effective strategy and the company has expanded into multiple governorates across the country.

## Conclusion, policy implications, and recommendations

Addressing entrenched issues within Iraq's party-dominated economy requires recognition of the challenges that businesses face, including bureaucratic complexity and intricate political dynamics. The government's failure to create conditions for businesses to flourish has inevitably led to an economy controlled by a select few with privileged access to state resources.

Iraq's [white paper](#) offered potential remedies for the hurdles facing businesses, such as reviving the private sector support fund, simplifying bureaucratic procedures for the private sector, and supporting small and medium-sized businesses. However, this effort has been ineffective due to the government's selective approach and lack of implementation. Moreover, while international donors have sought to bolster Iraqi entrepreneurs and promote private sector growth, many of these initiatives have failed to introduce real reforms. Sometimes they had the effect of reinforcing the political elite's stranglehold on the public and private sectors.

Increased transparency within the bureaucracy is an important first step toward reducing bureaucratic hurdles and eliminating the grip of the political elite on Iraq's economy. The elite's control over bureaucratic processes stems from a lack of clarity about what procedures businesses must follow, which are often subject to change. Streamlining procedures and implementing digital services will help address this and reduce interference from political actors.



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These recommendations can be implemented in several ways. First, the Iraqi parliament should pass an "access to information" law mandating that ministries and governmental bodies must publicly share their data. This would establish a framework of transparency that is immune from manipulation and decrease the politically sanctioned corruption within the ministries.



Laborers at a brick factory in Nahrawan town near Baghdad, Iraq, June 14, 2023. Source: Reuters

Second, the government, through the Council of Ministers' Secretariat, should modernize its e-governance infrastructure, with [UR platform](#) (the Iraqi government's digital services center) as a starting point. This will facilitate seamless electronic transactions for businesses and circumvent bureaucratic barriers that are often exploited by the political elite.

Third, international organizations like UNDP can play a positive role by providing support for these initiatives. This includes technical assistance, capacity enhancement, and sharing best practices. To ensure the practical application and sustainability of these proposals, partnerships should be made with reformists within the system. Their involvement will help guarantee effective implementation and long-term viability.

Addressing the core issue of interference by political elites and their exploitation of Iraq's resources is pivotal. If this is not rectified, including in the development of the private sector, businesses that do not have connections will continue to struggle. The urgency of this problem will only increase as demographic and climate pressures grow and more people migrate to the cities looking for work.

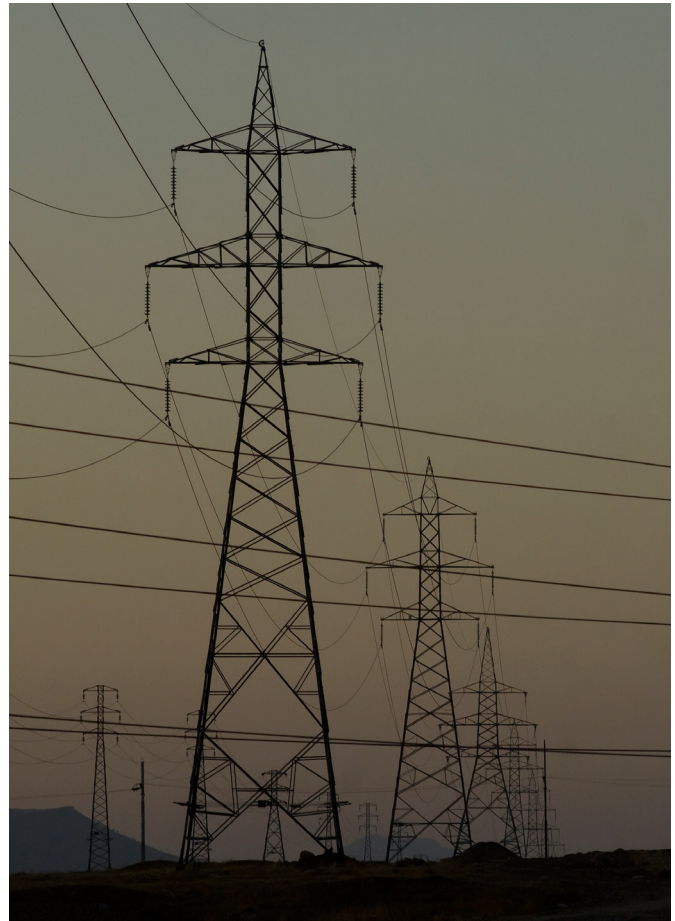
# Iraqi Kurdistan's Electricity Crisis: Challenges and Sustainable Solutions

*Dashti Adil*

## Introduction

Growing up in a rural village in the Kurdistan Region of Iraq in the early 2000s, I detested the frequent power outages nearly as much as the lengthy political speeches of Saddam Hussein on TV. Both interrupted the precious 15-minute slot allocated to my favorite cartoon. Twenty years have passed since the US-led invasion in 2003 and the Kurdistan Regional Government (KRG) has enjoyed wide latitude in its politics and energy policy during this period, but power outages remain endemic. In the years to come, the KRG will continue to struggle to provide its citizens with an uninterrupted power supply unless fundamental changes are made to the organization of the electricity network. Reimagining the structure of the grid is particularly complex in an era of climate change. KRG policymakers must embrace solutions that both expand electricity coverage in the short-term and lay the foundation for long-term environmental sustainability – an exceedingly difficult set of competing objectives.

The steady and insatiable increase in demand for electricity in the Kurdistan Region presents a major challenge. From 1991 to 2003, the area relied solely on two hydropower stations to meet its relatively limited energy needs. With the opening of the country to international trade after the fall of the Ba'athist regime, power-hungry electrical appliances flooded the market without any restrictions. This caused an abrupt rise in demand. Despite increasing nameplate generation capacity from [649 MW to 6,737 MW](#), a nearly 1,200% increase in generation capacity, [actual generation](#) hovers around 3,500 MW. Meanwhile, [demand ranges](#) from 5500 MW in the summer to 7000 MW in the winter.



Electricity power lines in Erbil landscape. October 4, 2009.  
Source: Shutterstock

## Impact of power outages

Prolonged power outages profoundly impact the growth of all economic sectors in the Kurdistan Region. Power-intensive businesses and factories are forced to curtail their operations during blackouts or resort to using expensive generators. Onsite electricity production using diesel generators is twice as expensive at current fuel prices for the industrial and commercial sectors compared with the cost

of electricity from the public grid. This significantly reduces the competitiveness of goods made at local factories with imports because of increased operation costs.



**The KRG will continue to struggle to provide its citizens with an uninterrupted power supply unless fundamental changes are made to the organization of the electricity network.**

The residential sector also suffers from power outages. To address this gap, small-scale diesel generators are used in most neighborhoods. These generators power an inefficient and disorganized electrical network and have a [carbon footprint twice](#) that of the public grid per unit of energy. Furthermore, neighborhood generators provide electricity based on maximum ampere subscription at a very [expensive price](#), reaching as high as \$15 per ampere.

Heat cycle AC systems, which form the majority of the residential load, require more power than the generator subscriptions can provide. As a result, households must resort to using inefficient evaporative coolers during blackouts, consuming substantial amounts of water in a region suffering from a [water scarcity crisis](#).

The lack of access to reliable electricity disrupts the smooth operation of businesses and factories, potentially causing the stagnation of the economy. At the same time, the absence of reliable electricity for the region's residents is an important factor in exacerbating social discontent and fomenting [protests](#).

Out of despair, many Kurds increasingly undertake risky attempts to [migrate to Europe](#) in search of better life conditions and economic opportunities.

## What is causing the problem?

When the Kurdistan Region achieved autonomy from Ba'athist Iraq in 1992, power generation came solely from the Darbandikhan and Dukan hydropower stations, which have a combined generation capacity of 650 MW. During the 1990s, electricity demand remained artificially low due to the Kurdish civil war and UN sanctions on Iraq as a whole, both of which drastically restricted economic development. However, since the US-led invasion in 2003 and the toppling of the Ba'athist regime, the Kurdistan Region has experienced a surge in international trade and economic development. This has increased the gap between electricity supply and demand. Exacerbating the shortfall are high levels of losses in the distribution network and limits on the amount of fuel available for power plants.

Electricity losses are a substantial challenge for the KRG, where the Ministry of Electricity (MOE) claims that 40% of electricity is lost in the distribution network. It is worth mentioning that the majority of this loss is due to theft, non-billing, and non-collection. The MOE also suffers from an inefficient residential pricing scheme. To explain, the current [consumption-based billing policy](#) for the residential sector starts from \$0.013 per kWh and stops at \$0.18 per kWh. This pricing scheme is extremely cheap and only covers 10% of the generation costs. Also, the low incremental increase in cost does not motivate energy conservation as the incremental increase in monthly energy consumption cost is capped at 5,000 kWh. Also, the MOE has said that it has \$1 billion worth of unpaid consumer bills, and the residential sector accounts for [70% of the total](#). Enforcing a strict billing policy by the MOE is a very challenging task. It might spark widespread protests and resistance from the public for two major reasons. First, the MOE does not provide stable and reliable power during all seasons and blackouts can last for 12 hours per day during high demand periods in



summer and winter. The KRG owes public servants a considerable amount of backpay as a result of an [austerity program](#) that withheld portions of their salaries between 2014 and 2019. It is unclear when the government will pay back these outstanding debts. Therefore, many consumers are not willing to pay for electricity unless they are forced to do so.

The government's inability to reduce electricity losses over the past two decades has created a dissonance in the consumer's mind regarding their influence on the power grid. An influx of inefficient, electrical appliances and building materials like hollow concrete blocks has flooded the market, which has raised [peak electricity demand](#) to 7000 MW. To put this into perspective, the average energy consumption per capita in the Kurdistan Region is 3,918 kWh, significantly higher than in neighboring countries like Jordan, where it is [1,539 kWh](#). The current billing policy discourages the installation of residential solar power systems. At the moment, companies working in the renewable energy sector are struggling to make sales because the break-even point for switching to a solar power system is more than 7 years.



**The government's inability to reduce electricity losses over the past two decades has created a dissonance in the consumer's mind regarding their influence on the power grid.**

Without a sufficient fuel supply, power plants are unable to make up the huge gap between electricity supply and demand. Although the generation capacity of power plants in the Kurdistan Region has grown from [649 MW to more than 6,737 MW](#) since 2003, representing 13.1% average annual growth, actual output stands at just 3,500 MW. Most local power plants run on natural gas, but the nearby gas fields in Khor Mor, which are operated by Dana Gas,

can only produce around [500 MMscf per day](#). This is insufficient to reach full generation capacity. To do so, the KRG and Dana Gas would need to increase the production capacity of Khor Mor to 1,000 MMscf per day and finish a planned gas pipeline between Erbil and Duhok. Currently, the Duhok power plant is only generating 80 MW out of its nameplate capacity of 1,000 MW because it cannot get enough fuel. It is worth mentioning that the Kurdistan Region has proven natural gas reserves of [25 trillion cubic feet](#) (tcf), but disputes between the KRG and Iraq's federal government over the oil and gas law have made further investment in the Kurdistan Region's gas fields a risky bet. For example, Dana Gas had initially planned to increase its production capacity at Khor Mor to 750 MMscf per day by April 2023.

However, disagreements between the Kurdistan Democratic Party (KDP) and the Shia Coordination Framework (SCF) over the formation of the new federal government in 2022 coincided with the [bombardment](#) of Dana Gas facilities in Khor Mor, further complicating talks between the two sides. This prompted a decision to delay the expansion plans.

## What are the short and long-term solutions?

Meeting electricity demand in the Kurdistan Region is a substantial challenge, but it can be overcome by modernizing the grid, improving billing policy, and increasing fuel supplies to power plants. The most important step in closing the gap between supply and demand is reducing inflated demand on the power grid. The MOE needs to modernize its infrastructure and improve its pricing scheme and billing policy. Modernizing the grid will allow the MOE to easily pinpoint where electricity is illegally being drained from the network through hooking and theft and enhances its ability to monitor and control electricity flows in real time. After it installed just a portion of the planned 1.5 million smart meters, the MOE claimed that there was a [10% reduction](#) in commercial and technical losses.

To eliminate these losses entirely, however, every user must have a smart meter.

A new pricing scheme should be introduced with a higher incremental increase to motivate consumers to reduce their monthly electricity consumption. The government should stop its subsidies for households with an average monthly consumption of over 2,200 kWh and the incremental increase should reflect a consumer's stress on the grid. The new pricing scheme would mean the government would receive more revenue, without a regressive impact on low-income families with low levels of energy consumption. Modernizing the grid and improving billing policy will also enable the introduction of demand response programs that can shift peak loads and reduce frequent power outage hours. As a result, the MOE would have a better understanding of the actual stress on the grid and help it make well-informed investment decisions about generation, transmission, and distribution.

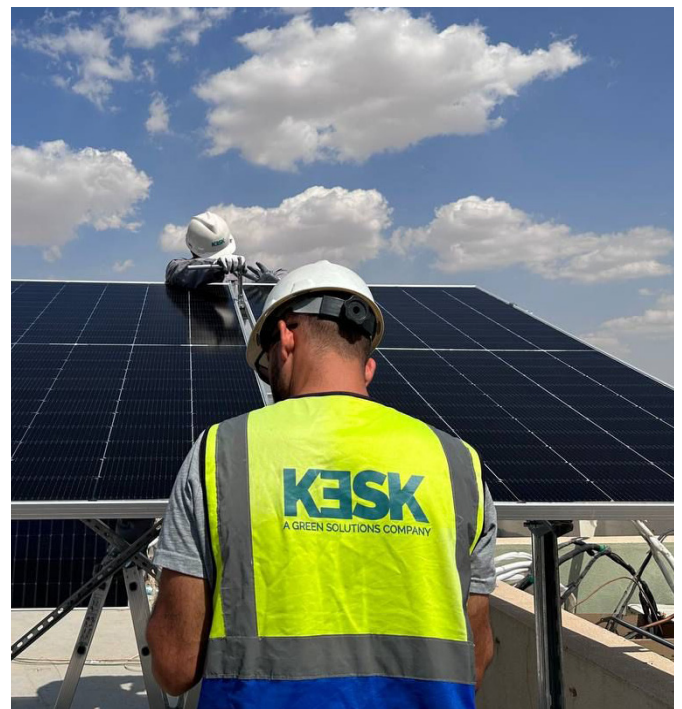


**By incentivizing the integration of solar power systems into the electrical network, the KRG can swiftly expand its generation capacity without increasing emissions.**

Increasing the fuel supply to power plants is another approach for closing the gap between supply and demand. Even though the Kurdistan Region has proven gas reserves of over [25 tcf](#), current annual gas production is just 5.4 billion cubic meters (bcm), which is only sufficient to generate 3,500 MW. To increase gas production, the KRG needs to provide a safe environment for gas operators to expand production capacity and secure the constitutional right to manage its gas fields. Therefore, the KDP and the Patriotic Union of Kurdistan (PUK) need to present a united front in the Iraqi parliament and reach a consensus with the SCF on a national hydrocarbons law. At present, however, political conditions make this difficult. Nevertheless, doing so would attract foreign investment in the development of the existing gas fields at Khor Mor

and the untapped ones at Bina and Miran. These steps would increase gas production delivery to the power plants and allow them to operate at their rated capacity of 6,500 MW.

Taking these steps will also put the Kurdistan Region on the right path toward decarbonizing its energy system by lowering the cost of installing residential and commercial solar power systems. The absence of power outages will eliminate the need for battery storage capacity, which would reduce the capital cost necessary to install systems. The new billing policy would also improve the return on investment of both residential and commercial solar power systems. Combined with the current Net Zero billing policy by the KRG, they will become the cheapest and most attractive source of energy. By incentivizing the integration of solar power systems into the electrical network, the KRG can swiftly expand its generation capacity without increasing emissions. Also, the new billing policy automatically forces the adoption of efficient electrical appliances and building materials on the market, reducing stress on the grid and clearing transmission capacity for the electrification of the transport sector in the future.



Installation of a hybrid solar PV system in Erbil. August 2023.  
Source: KESK

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The Economy in an Era of Climate Change

