

## European Solar Energy Storage

# Iraq hydroelectric storage



## Overview

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Mosul Dam (Arabic: **الموصل سد**), formerly known as Saddam Dam (**سد صدام**), is the largest dam in Iraq. It is located on the Tigris river in the western governorate of Nineveh, upstream of the city of Mosul. The dam serves to generate hydroelectricity and provide water for downstream irrigation. At full capacity, the structure holds about 11.1 cubic kilometres (2.7 cu mi) of water and provides electricity to the 1.7 million residents of Mosul. The dam's main 750-megawatt (1,010,000 hp) power station contains four 187.5-megawatt (251,400 hp) Francis turbine-generators. A pumped-storage hydroelectricity power plant with a capacity of 250 megawatts (340,000 hp) and a run-of-the-river dam downstream with a 62-megawatt (83,000 hp) capacity also belong to the Mosul Dam scheme. It is the fourth largest dam in the Middle East, as measured by reserve capacity, capturing snowmelt from Turkey, some 70 miles (110 km) north. Built in the 1980s on a karst foundation, concerns over the dam's instability have led to major remediation and rehabilitation efforts since the 2003 U.S. invasion of Iraq.

The Mosul Dam is a 113 m (371 ft) tall and 3.4 km (2.1 mi) long earth-fill embankment type with a clay core. The width of the crest is 10 m (33 ft). At an elevation of 330 m (1,080 ft) above sea level, the reservoir, named Lake Dahuk, withholds 11,100,000,000 m<sup>3</sup> (9,000,000 acre·ft) of water. Of that capacity 8,100,000,000 m<sup>3</sup> (6,600,000 acre·ft) is active (or useful for power and downstream releases) and 2,950,000,000 m<sup>3</sup> (2,390,000 acre·ft) is inactive (dead) storage. On the east side of the dam is the service which is controlled by five and has a maximum discharge capacity of 13,000 m<sup>3</sup>/s (460,000 cu ft/s). Further to the east is a -controlled emergency spillway with a 4,000 m<sup>3</sup>/s (140,000 cu ft/s) capacity. At the toe of the dam on its west side is the main hydroelectric power station (Mosul 1). It contains four 187.5 MW (251,400 hp) generators for an installed capacity of 750 MW. Behind the power station are four . Downstream of the dam is the Mosul regulation dam, which serves to

regulate the tail-waters of the main dam and to generate electricity as well. The hydroelectric plant (Mosul 2) has an installed capacity of 62 MW with four 15.5 MW generators. Immediately upstream of the dam is the 240 MW power station (Mosul 3). It serves as a by pumping water to small reservoir above Lake Dahuk, storing it, then releasing the water back down to two 120 reversible Francis turbines during peak energy usage. The entire Mosul multi-purpose project has an installed capacity of 1,052 MW.

Before the damTo ensure as many of the archeological sites were inspected before being submerged under the lake that would form behind the dam, the Iraqi government invited several foreign delegations to participate. This rescue operation included the British Archaeological Expedition to Iraq. Before the damTo ensure as many of the archeological sites were inspected before being submerged under the lake that would form behind the dam, the Iraqi government invited several foreign delegations to participate. This rescue operation included the British Archaeological Expedition to Iraq as a prominent participant. In 1985, one of their sites, garnered an Assyrian fibula, some Hellenic oil lamps, and a coin of . In 2010, following a massive drought, the ruins of an ancient palace were discovered in the reservoir. The palace, which is approximately 3,400 years old, is believed to have belonged to the . The first excavation occurred in 2019 by a joint Kurdish-German team. The ruins include a terrace of mud bricks, walls two meters high and two meters thick, wall paintings, and ten clay tablets covered in . PlanningDevelopment of Iraq's rivers progressed rapidly in the mid-20th century as Saddam Hussain sought to control water resources for agriculture and to prevent flooding in . Planning for the Mosul Dam began in the 1950s with the help of , a British firm who identified a l.

The earthen is located on top of , a soft mineral that dissolves in contact with water. Continuous maintenance is required to plug, or "", new leaks with a liquefied slurry of cement and other additives. More than 50,000 tonnes (49,000 long tons; 55,000 short tons) of material have been injected into the dam since leaks began forming shortly afte. The earthen is located on top of , a soft mineral that dissolves in contact with water. Continuous maintenance is required to plug, or "", new leaks with a liquefied slurry of cement and other additives. More than 50,000 tonnes (49,000 long tons; 55,000 short tons) of material have been injected into the dam since leaks began forming shortly after the reservoir was filled in 1986, and 24 machines currently continuously pump grout into the dam base. Between 1992 and 1998 four sinkholes formed downstream of the dam and a fifth sinkhole developed east of the dam in February 2003 that was filled several times. In August 2005 another sinkhole developed to the east. A September 2006 report by the noted, "In terms of internal erosion potential of the foundation, Mosul Dam is the most dangerous



imported electricity respectively.

How many dams are there in Iraq?

In Iraq there are 12 large dams for irrigation projects, 275 irrigation pump stations, 27,000 km of irrigation channels and 3.25 million hectares irrigated.

Will Iraq send 500 soldiers to defend Mosul Dam?

"Italy to send 500 soldiers to defend Iraq's largest dam in Mosul". Telegraph. Retrieved 30 December 2015. ^ a b "Iraq's Mosul dam could face catastrophic collapse: top U.S. general". News.Yahoo.com. Reuters. 28 January 2016. Retrieved 29 January 2016. ^ "Iraq's water minister judges only tiny danger of Mosul dam collapse".

## Iraq hydroelectric storage

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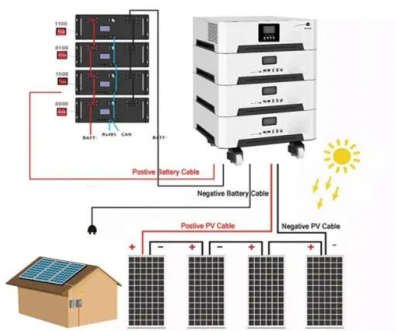


### [Iraqi Academic Scientific Journals](#)

Iraq has 10 hydroelectric plants, two of them are in the Kurdistan region because it has got a geographical potential, which has allowed it to invest this important source, particularly its ...

## Iraq

Between 2003 and 2022, Iraq the installed capacity of hydroelectric pumped storage electricity remained stable at around 0.24 million kilowatts. The description is composed by our digital data assistant.

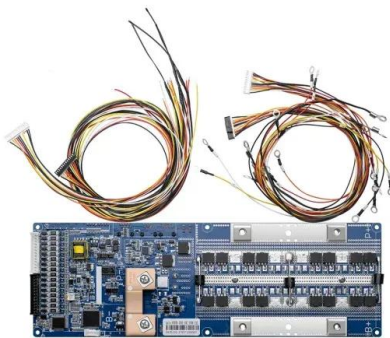


### [Hydro upgrade in Iraq](#)

This is why hydro, although attributed the lowest priority, has actually had the greatest effect. By a huge margin, most of the capacity thus far added in Iraq has been in hydro power. Looking forward, with an ultimate capacity target of up to 20,000MW, hydro power in Iraq can still go a lot further. Tables Table 1

## Water Resources Projects in Iraq: Medium and Small Storage Dams

Mosul Dam is located on the River Tigris about 60 km northwest Mosul in Iraq. It is the biggest dam where its storage capacity reaches 11.11 billion cubic meters at normal operational level (330 m



## Hydropower and pumped-storage in Israel - The energy

...

been the case in countries like Peru, Pakistan and Iraq. Thus, one potential benefit of the Mediterranean Dead Sea projects and other pumped hydroelectric storage projects is increasing geographic distribution of electric power stations. Hence, Israel's lack ...

## Pumped-storage hydroelectricity

Pumped-storage hydroelectricity (PSH), or pumped hydroelectric energy storage (PHES), is a type of hydroelectric energy storage used by electric power systems for load balancing. A PSH system stores energy in the form of gravitational potential energy of water, pumped from a lower elevation reservoir to a higher elevation. Low-cost surplus off-peak electric power is typically ...



## (PDF) Improving the Management of the Hydropower System

In this research, the identification of suitable locations for hydroelectric power stations installation concerning electricity generation

capacity has been investigated.



## The Effects of Climate Change on Hydroelectric Power in Iraq

Iraq Electricity Sector Overview: In Iraq, electricity is supplied by 9.22% from hydro power, 80.49% from fossil fuel power plants, and 10.29% imported electricity.



## Optimization and Operation of Stand-alone Hybrid PV/Biomass

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Corpus ID: 233226139; Optimization and Operation of Stand-alone Hybrid PV/Biomass/Hydroelectric Pumped Storage Energy System in Iraq

@article{Alakayshee2021OptimizationAO, title={Optimization and Operation of Stand-alone Hybrid PV/Biomass/Hydroelectric Pumped Storage Energy System ...

## Optimization and Operation of Stand-alone Hybrid ...

PV/Biomass/Hydroelectric Pumped Storage Energy System in Iraq Ahmed S. Al-akayshee1 (Storage) as a study case in Iraq which is

considered a clean, inexhaustible, and reliable energy to achieve



## Design and evaluation of PV-wind hybrid system with hydroelectric

A mathematical model, which describes the operation of a proposed hybrid system, including solar PV, wind energy, and a pumped storage hydroelectric power plant is developed in this paper. This hydropower plant utilizes seawater as a lower reservoir, and only a tank has to be built in order to reduce the installation cost of the storing system.

## Iraq Hydroelectricity net generation, 1973-2017

3.30 (billion kilowatthours) in 2016. The amount of gross generation less the electrical energy consumed at the generating station(s) for station service or auxiliaries. Electricity required for pumping at pumped-storage plants is regarded as electricity for station service and is deducted from gross generation. Both conventional and combined hydroelectric plants. Conventional ...



## An outlook on deployment the storage energy technologies in Iraq



However, the cost analysis has shown that for 50 kW concentrated solar power in Iraq, the cost is around 0.23 US cent/kWh without integration with energy storage.

## An outlook on deployment the storage energy technologies in Iraq

The total annualized price based on 2018 is 464.37\$/kw [28]. 2.3 Pumped Hydro Storage (PHS) The basic principle of a pumped hydro system (PHS) is to use surplus electrical energy (off-peak energy) to transfer water to a higher reservoir and store it as potential energy. As the paper discussed the most suitable energy storage for Iraq, all



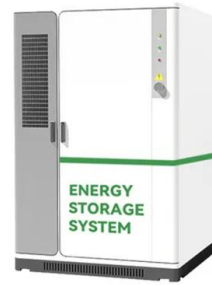
## Haditha Dam

Machine hall of the Haditha Power Station. The Haditha Dam (Arabic: سد هادثة, romanized: Sadd ḥadṯha) or Qadisiya Dam is an earth-fill dam on the Euphrates, north of Haditha (Iraq), creating Lake Qadisiyah (Arabic: بحيرة قاديسية). The dam is just over 9 kilometres (5.6 mi) long and 57 metres (187 ft) high. The purpose of the dam is to generate hydroelectricity, regulate the flow

## [Power plant profile: Mosul 3, Iraq](#)

The project is currently owned by Government of Iraq. Mosul 3 is a pumped storage project. Contractors involved Franco Tosi Meccanica was selected as the turbine supplier for the hydro

power project. The company provided 2 units of pump turbines, each with 120MW nameplate capacity. For more details on Mosul 3, buy the profile here.



## The impact of Ilisu Dam on water flow toward Iraq and identifying ...

The primary aim of this research is to investigate the impact of dams constructed in Turkey on the operational policy of the Mosul Dam. The study employs non-linear programming to establish an optimization model for the Mosul Dam reservoir, with the goal of maximizing hydropower generation and determining the optimal operation policy. Statistical ...

## iraq south africa pumped storage power station signed

Zimbabwe: Solar powered pumped hydroelectric energy storage plant by Ngonyezi . The pumped-storage hydroelectricity plant proposed by Ngonyezi Projects will have a capacity of 2,000 MWh and will be supported by a 300 MWp photovoltaic solar power plant. Thus, on sunny days, the solar power plant provides electricity to the population.



## Mosul Dam rehab project wins award for work done deep in Iraq's



The Deep Foundations Institute presented its 2022 Outstanding Project Award to the Mosul Dam Rehabilitation Project in Iraq. The dam, which is on the Tigris River, dates to the 1980s and is the largest in Iraq at 113 m (371 ft) tall and 3.65 km (2.3 mi) long.

## Sulaimaniya , Iraq Business News

Qatar Airways launched flights on Wednesday to its fifth destination in the Republic of Iraq, Sulaymaniyah, increasing the airline's frequency across Iraq from 16 to 20 flights each week. The new services, which will operate four-times-a-week non-stop from the airline's Doha hub, brings the carrier's global network to 129 destinations



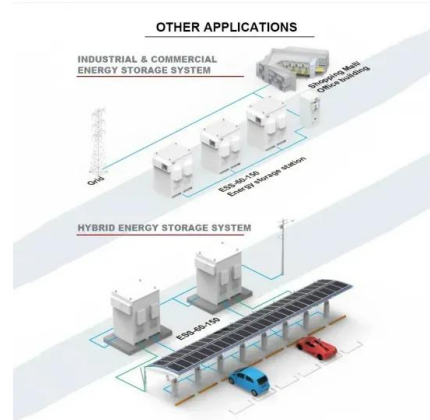
## Mosul Dam hydroelectric plant

Mosul Dam hydroelectric plant (???? ?? ?????? ??????????) is an operating hydroelectric power plant in Mosul, Tigris River Basin, Saslaj, Nineveh, Iraq. Conventional storage: Iraq Ministry of Electricity (????? ?????????? ??????????) Location Table 2: Location details for Mosul Dam hydroelectric plant.

## **Design of reliable standalone utility-scale pumped hydroelectric**

Over 94 % of global storage is provided by pumped storage hydropower (PHS), the most advanced energy storage technology, with an installed capacity of approximately 139.85 GW in 2023 [5]. Efforts to improve renewable energy's

market competitiveness focus on energy generating performance [6], transmission [7], storage [8], manufacturing, and



## Kundah Pumped Storage Hydroelectric Project

The State agency - Tamil Nadu Generation and Distribution Corporation Ltd. (TANGEDCO) - is the project proponent and asset owner. A pumped storage scheme is located in the Nilgiris hills of the Tamil Nadu State, the project will provide peaking benefits by utilising the existing reservoir at Porthimund as the upper reservoir and Emerald as the lower reservoir.

## (PDF) Improving the Management of the Hydropower System

Mosul Dam is located in the northwestern part of Iraq impounding the Tigris River; about 60 km north of Mosul city. revolutionary concepts for hydroelectric energy storage are also presented



## Masdar to assess pumped hydro storage projects in Uzbekistan

Pumped hydroelectric storage offers a steady and dependable energy storage solution that can function at a utility scale. The agreement marks Masdar's inaugural venture into pumped



hydropower storage. The move aligns with the company's expansion strategy and its commitment to supporting renewable energy initiatives globally.

## Latest Hydroelectric Power Plant Projects in Iraq (2024)

Search all the latest and upcoming hydroelectric power plant projects, bids, RFPs, ICBs, tenders, government contracts, and awards in Iraq with our comprehensive online database. Call +1(917) 993 7467 or connect with one of our experts to get full access to the most comprehensive and verified construction projects happening in your area.



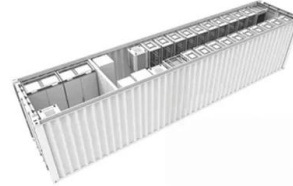
## An outlook on deployment the storage energy technologies in Iraq

PDF , This study aims to analyze and implement methods for storing electrical energy directly or indirectly in the Iraq National Grid to avoid , Find, read and cite all the ...

## The Effects of Climate Change on Hydroelectric Power in Iraq

Hydroelectric Power in Iraq DR. SAMEER SAADOON ALGBURI AL-KITAB UNIVERSITY COLLEGE IRAQ. The aim of this study (part1): Is to evaluate potential climate change impacts on 4 Mosul Dam pump storage plant 200 5 Mosul

Regulating Dam 60 6 Haditha Dam 660 7  
 Samaraa Barrage 80 8 Hemrin Dam 50



## List of Upcoming Hydroelectric Power Plant Projects in Iraq (2024)

Search all the announced and upcoming hydroelectric power plant projects, bids, RFPs, ICBs, tenders, government contracts, and awards in Iraq with our comprehensive online database. Call +1(917) 993 7467 or connect with one of our experts to get full access to the most comprehensive and verified construction projects happening in your area.

### [iraq new energy pumped storage](#)

An outlook on deployment the storage energy technologies in iraq. Storage energy technologies are intelligent as they diversify energy sources, develop economic growth and produce more jobs. Technologies like Redox Flow Batteries (RFB), Pumped Hydro Storage (PHS), Compressed Air Energy Storage (CAES) and other forms were analyzed within this study.



## Evaluation of development potential of pumped hydroelectric storage ...

Every year in China, a significant number of



mines are closed or abandoned. The pumped hydroelectric storage (PHS) and geothermal utilization are vital means to efficiently repurpose resources in abandoned mine. In this work, the development potentials of the PHS and geothermal utilization systems were evaluated. Considering the geological conditions and ...

## Optimization and Operation of Stand-alone Hybrid PV/Biomass

Request PDF , Optimization and Operation of Stand-alone Hybrid PV/Biomass/Hydroelectric Pumped Storage Energy System in Iraq , Isolated load is considered a popular case and especially in the



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