Politecnico di Torino

Dams & Reservoirs DAY 2025

Water and Energy security for Europe

ITCOLD

ITYP

OPEN DAY ON DAMS



Dams and environment: engineering solutions for the future

TORINO , 28 maggio 2025

Italian Committee on Large Dams ITCOLD

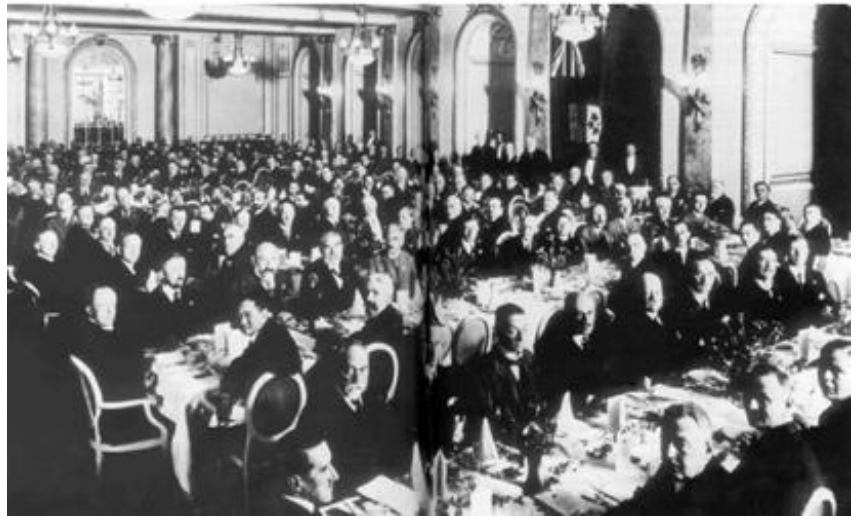
francesco.fornari@enel.com

ITCOLD – II Concorso Fotografico

What is ITCOLD?

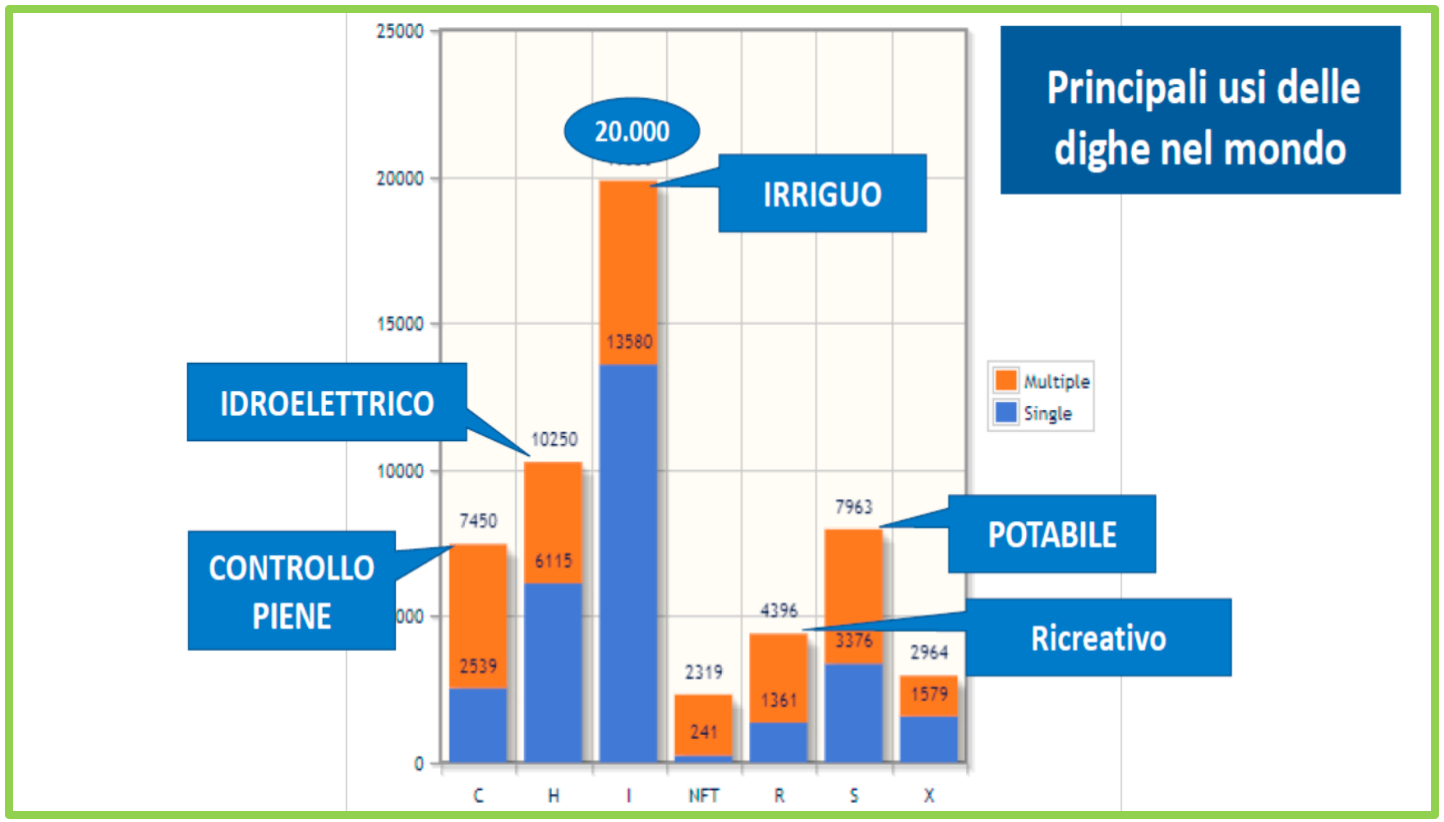
The Italian National Committee for Large Dams is a cultural and scientific association that aims to promote and facilitate the study of all problems related to dams, from their construction to their operation, control and maintenance.

The Committee participates in the International Commission on Large Dams, (ICOLD-CIGB) organization created in Paris in 1928 also with the participation of Italy
ICOLD - International Commission on Large Dams since 1928 , 100 Countries , 4 Regional Clubs; 198 Bulletins
This is the heart of ICOLD. On a single specific topic, our experts met for 3-5 years and produced a «state of the art» with recommendations for engineers around the world.



How many are the dams?

About 66.000 according to the world register WDR



Food security
contribute to 40% of agricultural production

Energy production
World 16%
Europe 12%

Flood control
Any important river is barred along its course

Some interesting data

Ancient dams

PROSERPINA	130	Spain
CORNALVO	144	Spain
ICHIBANIKE	400	Japan
SUMIYOSHIIKE	400	Japan
KAERUMATAIKE	607	Japan
SAYAMAIKE	616	Japan



PROSERPINA

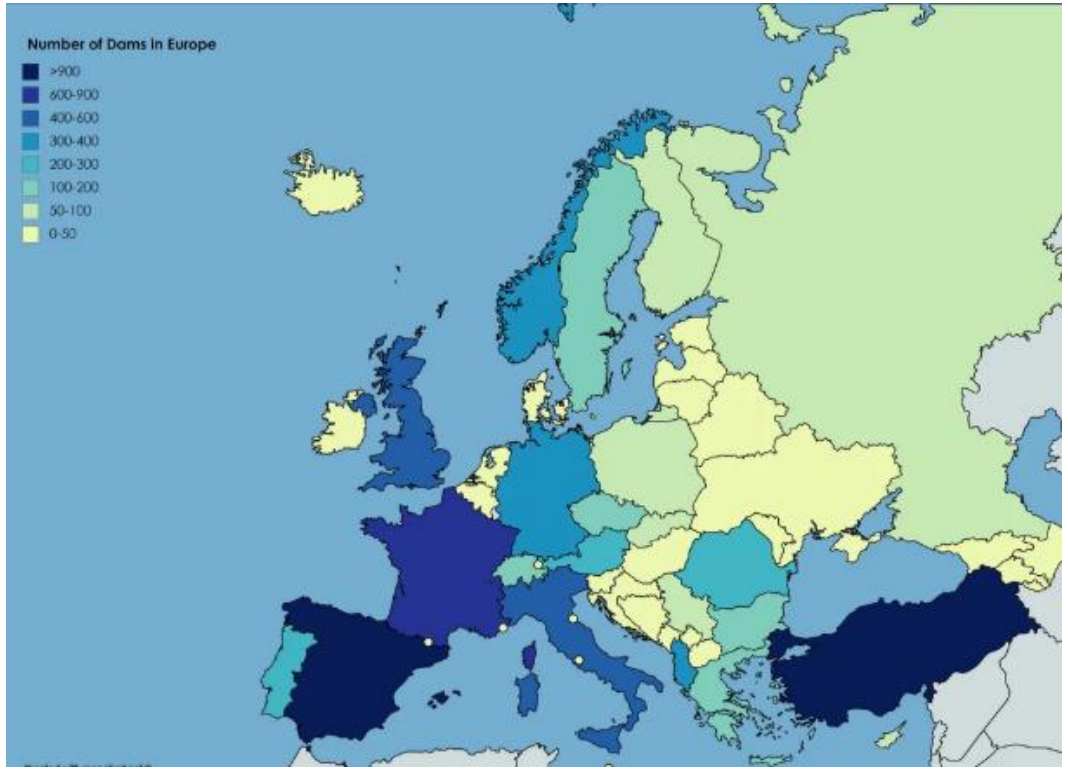
Bigger dams

Dam name	Height (m)	Purposes	Country
ROGUN (C)	335	HI	Tajikistan
SHUANGJIANGKOU (C)	315	H	China
JINPING 1	305	HC	China
NUREK	300	IH	Tajikistan
LIANGHEKOU	295	H	China
XIAOWAN	294	HCIN	China
BAIHETAN	289	H	China
XILUODU	286	HCN	China
GRANDE DIXENCE	285	H	Switzerland



JINPING 1

Dams in Europe and in Italy



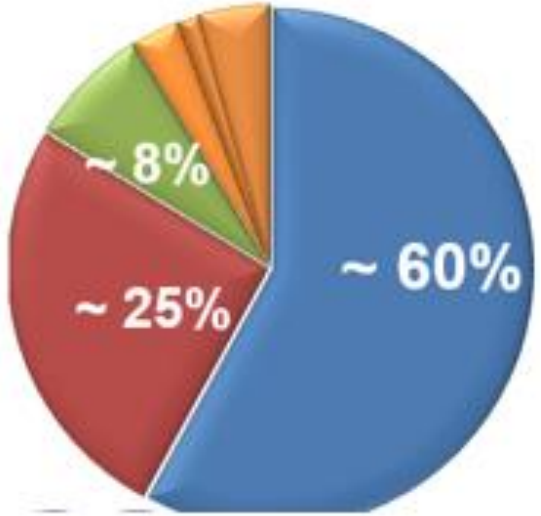
Industry and availability

Very few cases of new constructions

Any good site already infrastructured

Average age 60 year

In Italy 522



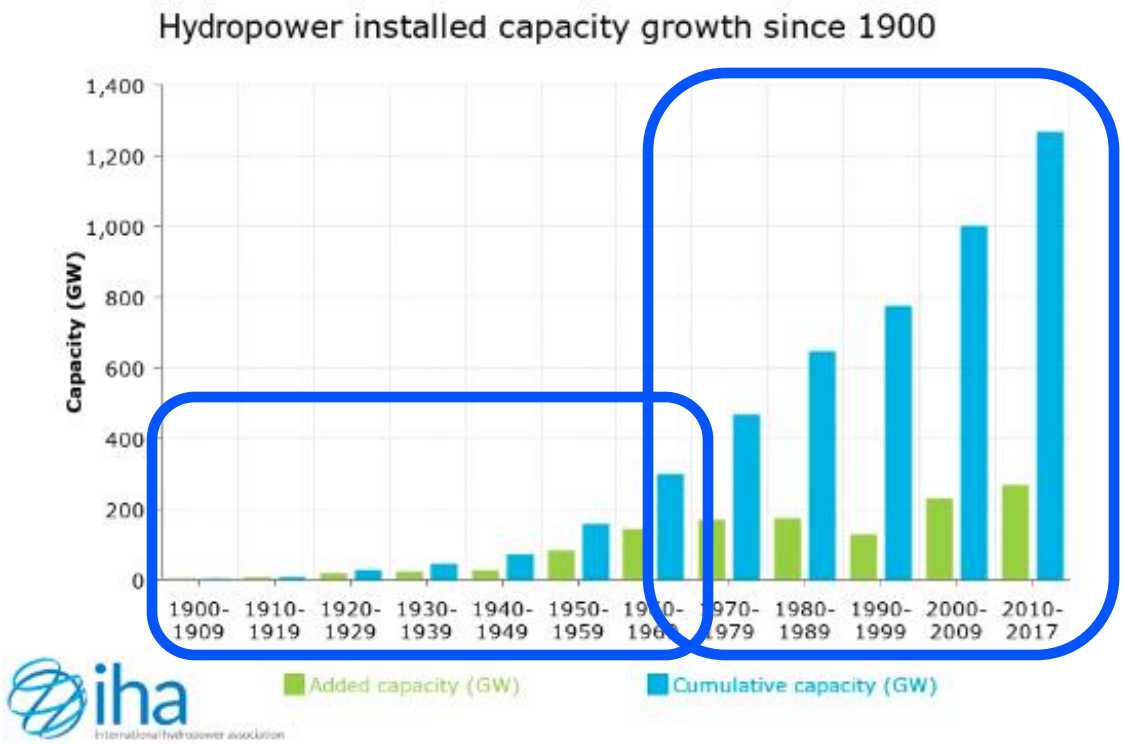
Hydropower

Irrigation

Drinking

More than 60% multiporpose

Hydreoelctric still growt







EUROPE AND NORTH AMERICA

OTHERS

22 TW
ITALY 18 TW

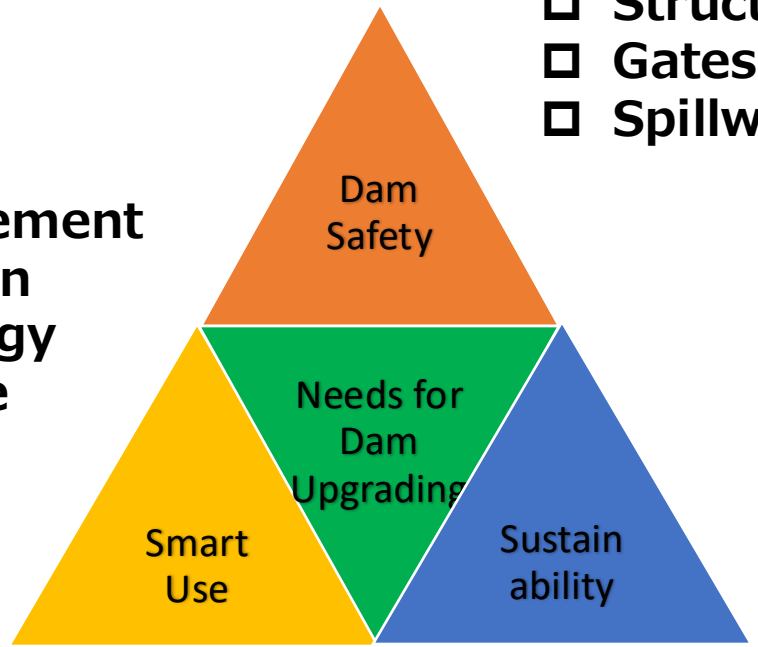
On what mature countries are working?

Three S : Safety, Smart use and Sustainability

Aged infrastructures need commitment and innovation

- Structural Safety
- Gates Safety
- Spillway Capacity

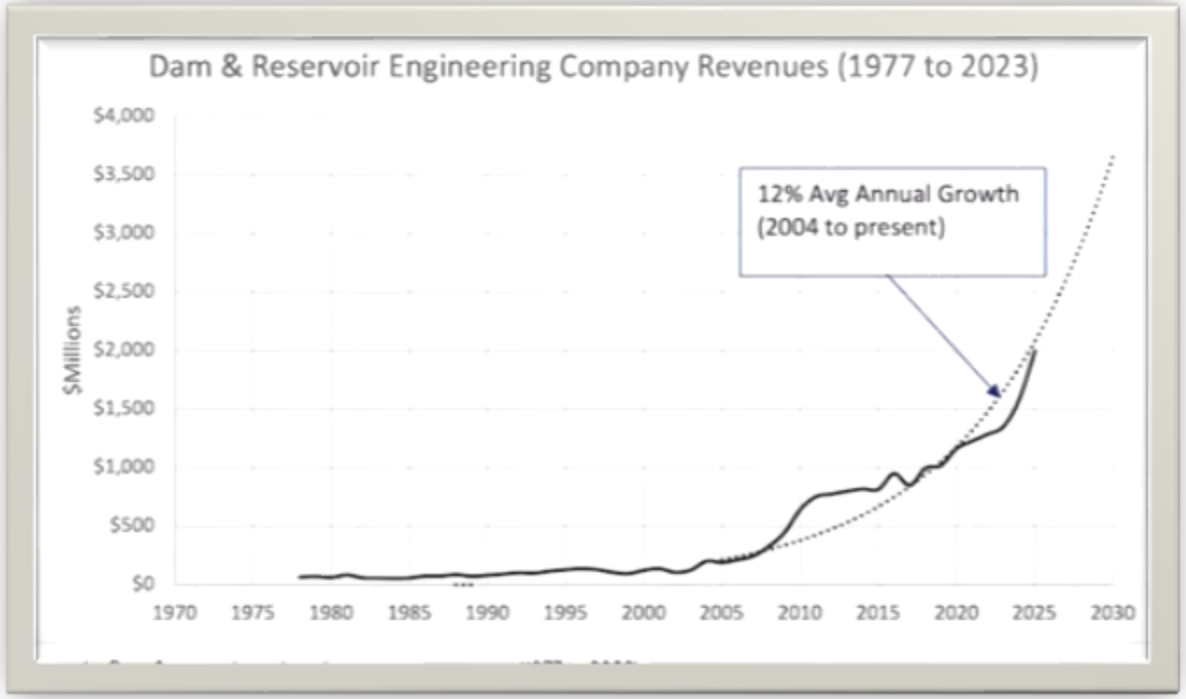
- Flood Mitigation
- Drought Management
- Energy Transition
- Renewable Energy
- Pumped Storage



- Reservoir Sedimentation
- Reservoir Water Quality
- Connectivity of Aquatic Lives
- Biodiversity

I will have a future studying dams?

INTERNATIONAL
WATER POWER
AND DAM CONSTRUCTION



Revenue of specialized companies in the USA

Analysis

Engineering booms as demand for dams surges

The dams market is busy. Very, very busy. Those of us working in this market are not surprised; the only surprise is just how busy we've been...and expect to be for many decades. For the last 20 years the dams and reservoirs market has averaged 12% year over year growth. In other words, beginning around 2004 this market has doubled every six years.

Will happen to us as in the states?

Are we ready to compete with competitors?

Will engineers paid better?

Young engineers have the floor