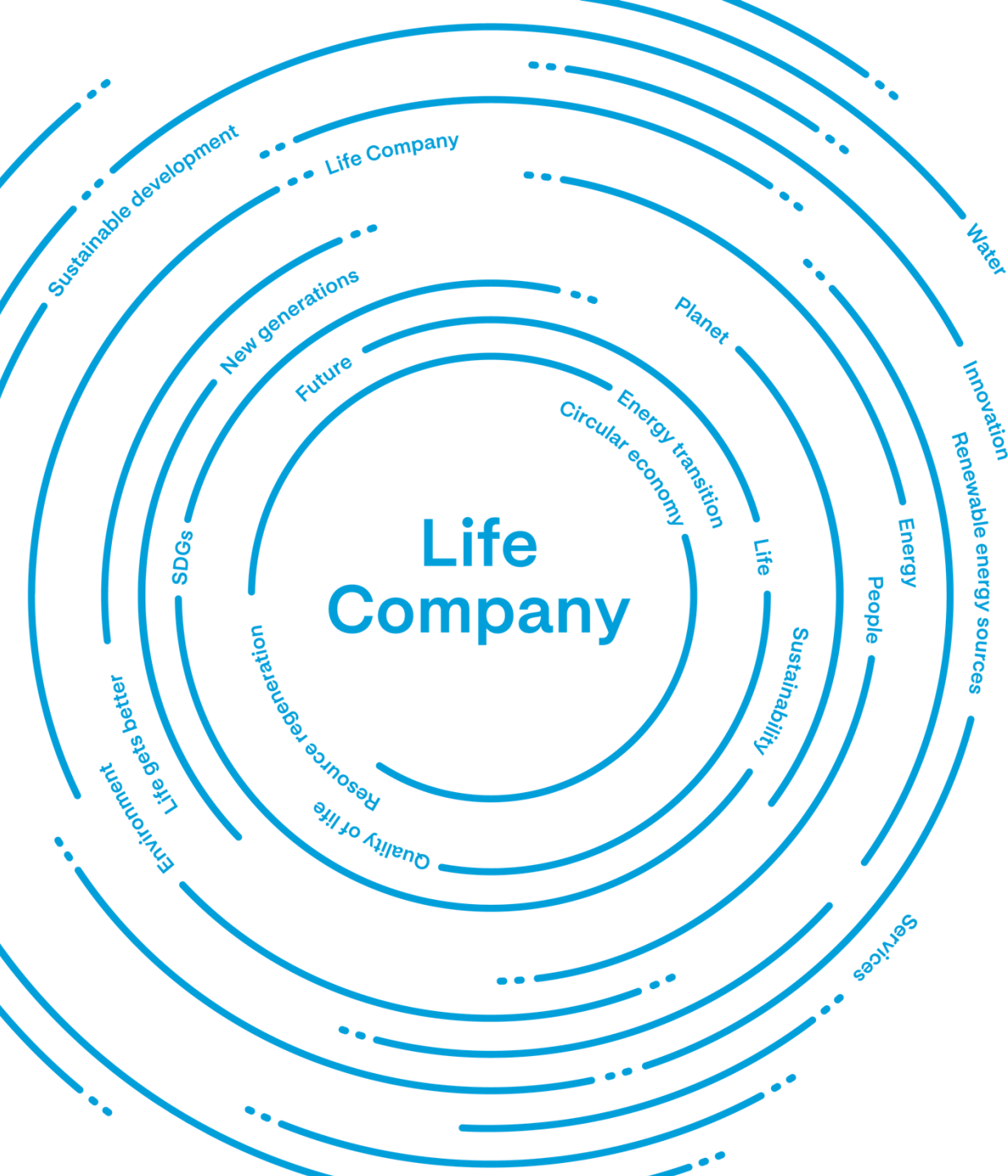




# A2A Site Visit Valtellina

Roberto Castellano  
A2A Hydroelectric Plants Development

July 2024

# 1998-2006 INVESTMENT CYCLE – PAST SITUATION

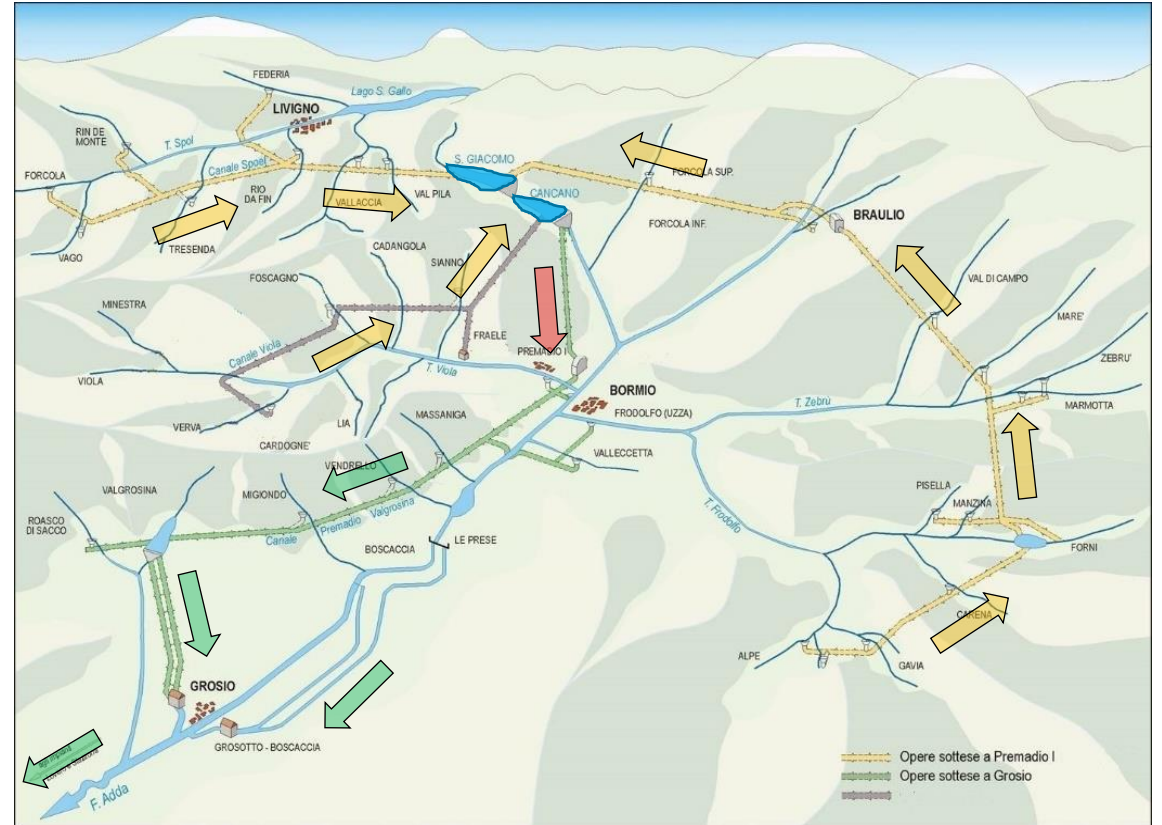
The core of A2A hydroelectric system was built in the period between 1930 and 1960.

## MID NINETIES OVERVIEW

**Two reservoirs:** total volume of about 160 Mm<sup>3</sup>  
(limited by stability issues on S. Giacomo dam)

**Three hydraulic tunnels** from the intakes to the reservoirs -  
one of them («Viola» Canal) with stability issues and limited functionality

**One pressure tunnel and penstock**  
to feed downstream plants



Power capacity of about 580 MW

Average energy generation of about 1,850 GWh/year

# 1998-2006 INVESTMENT CYCLE

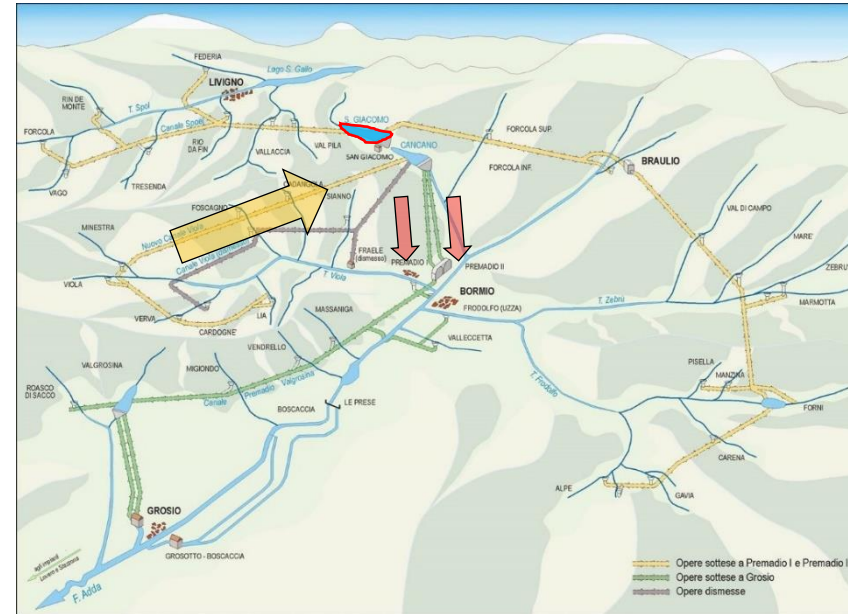
## GOALS

- **SAFETY:** remediation of the critical issues in Canale Viola and San Giacomo dam
- **RELIABILITY:** prevent “out-of-services” by doubling the pressure tunnel and the penstock that feed downstream HPPs
- **PROFITABILITY:** increase of energy production, reservoir volume and power capacity, thus shifting energy production from less valuable hours to more valuable hours
- **ECO-SUSTAINABILITY:** utilization of the same quantity of water, old landfill reclamation, visual impacts minimization

~300 € Mln

One of the largest hydropower investment cycle in the latest 50 years in Italy

# 1998-2006 INVESTMENT CYCLE – CURRENT SITUATION



- **3 fully reliable water tunnels** (including «New Canale Viola»)
- **2 pressure tunnels and penstocks** that can feed downstream plants even independently
- **2 reservoirs** with programmable volume capacity of 185 million m<sup>3</sup> (+ 15%)
- **Dams fully compliant with safety regulations**

**Power capacity of ~800 MW (+ 35%) and average energy generation of ~2,000 GWh/year (+ 8%) utilizing the same quantity of water resource**

# MAIN WORKS



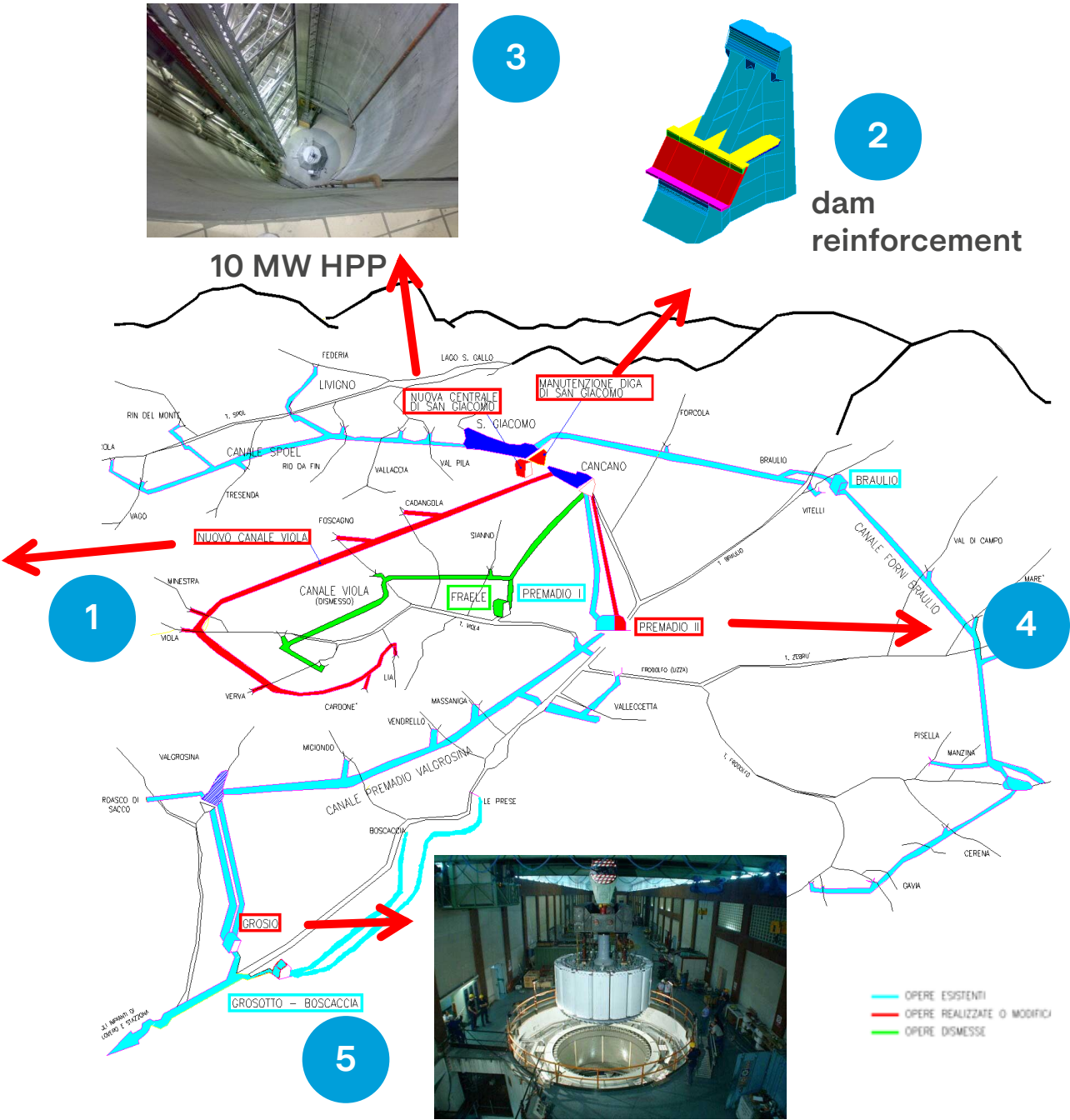
20 km water tunnel



7 new water intakes



400 kW HPP



- cavern powerhouse extension
- 3 km new water pressure canal



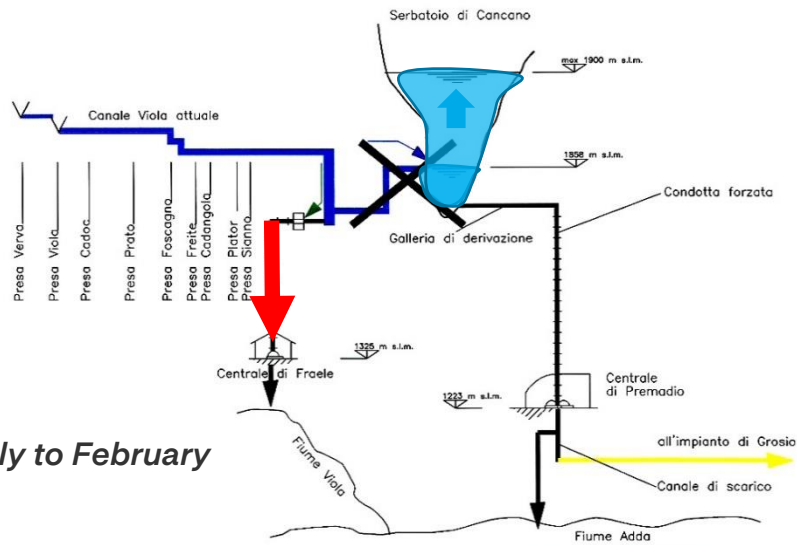
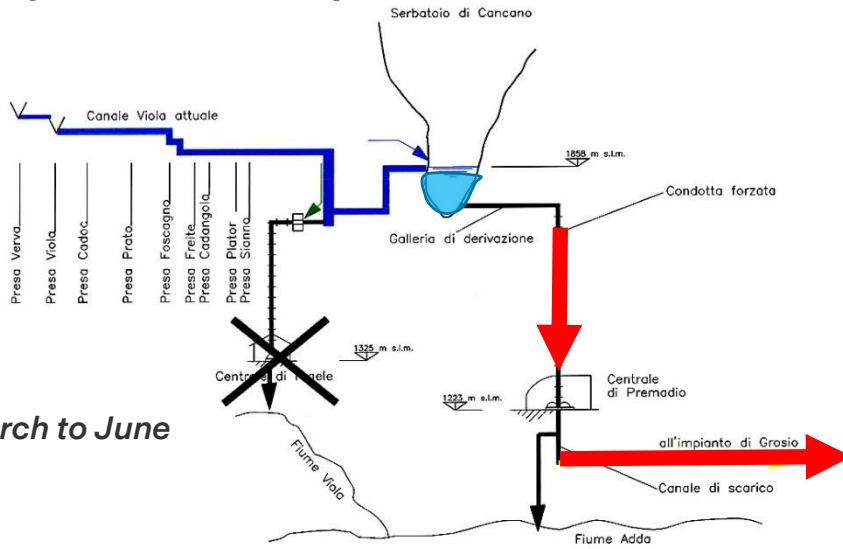
• Ø=2100 - L=1000 m  
new Penstock



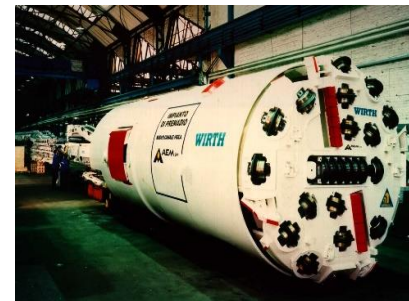
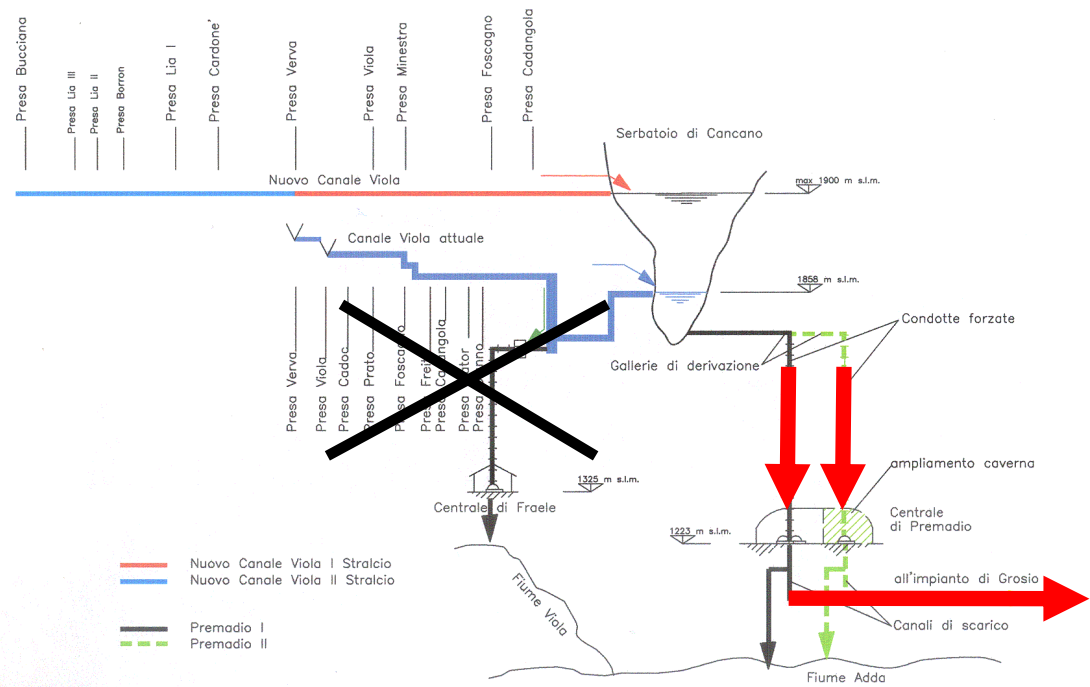
80 MW new generation Unit

# NEW «CANALE VIOLA»

## OLD «CANALE VIOLA» (year 1925 - superficial and cracked)



## NEW «CANALE VIOLA»



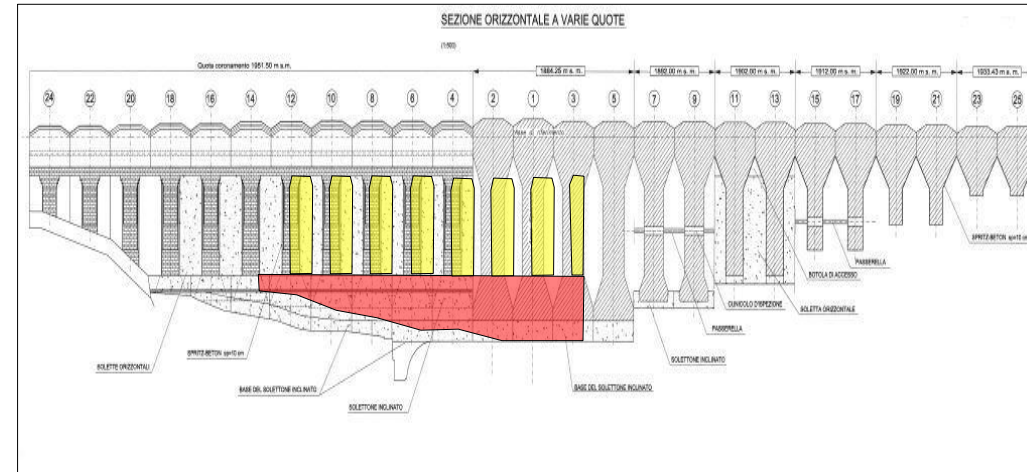
## 2 SAN GIACOMO DAM REHAB



Two contiguous lakes



**Old situation:** water entering among the buttresses and therefore causing buoyancy of the barrage



-  New inclined structure (height 18 m, length 260 m, thickness 3,5 m)
-  18 horizontal covering structures among buttresses (25 m x 8 m thickness 75 cm)
-  Surface resanation by shotcrete

## 2 SAN GIACOMO DAM REHAB



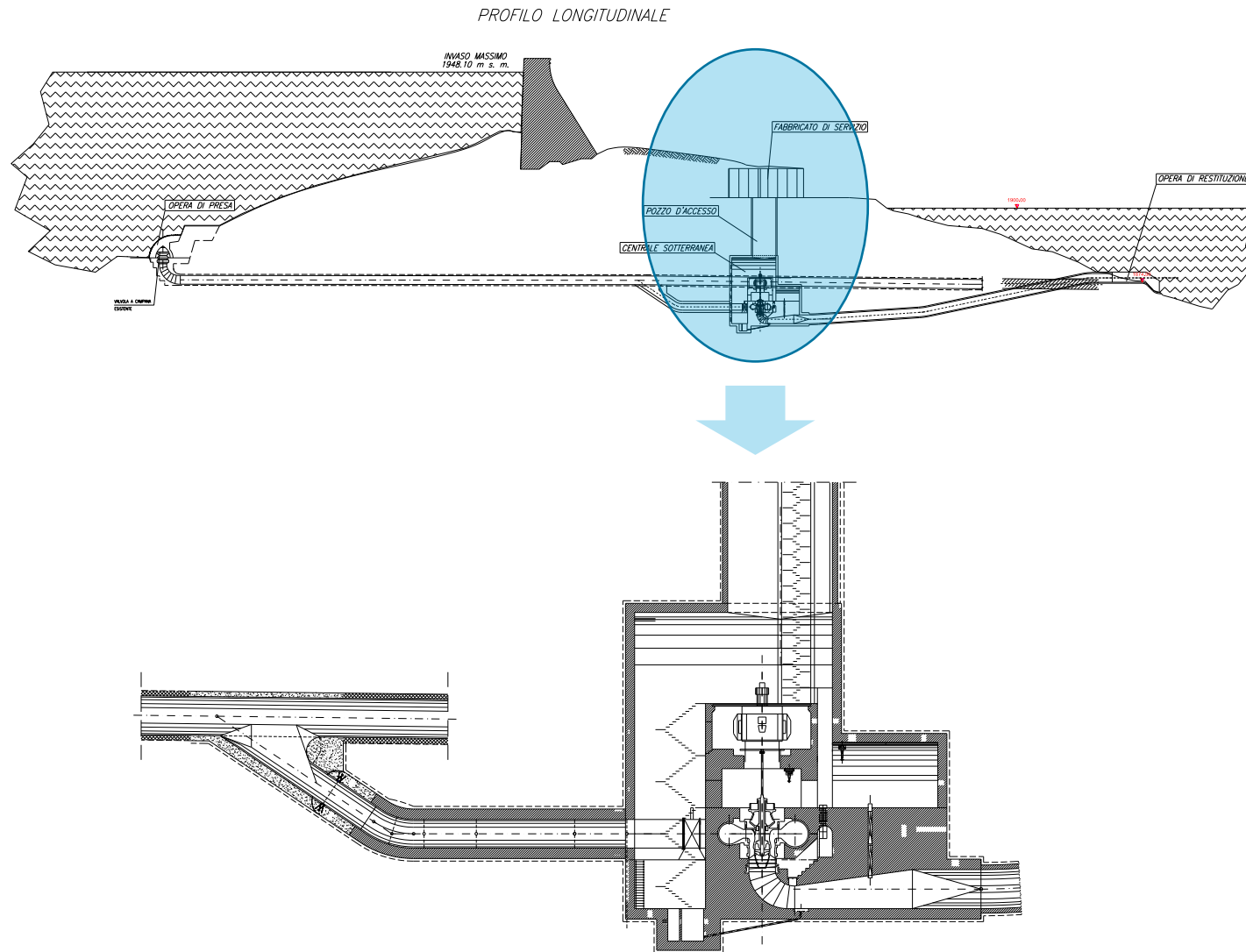
Before



After

### New situation:

- water not entering anymore among the buttresses and therefore the buoyancy of the barrage is avoided
- increase of weight, consequently increase of stability is achieved
- ice damage to the structure is eliminated.



Before



During construction



After



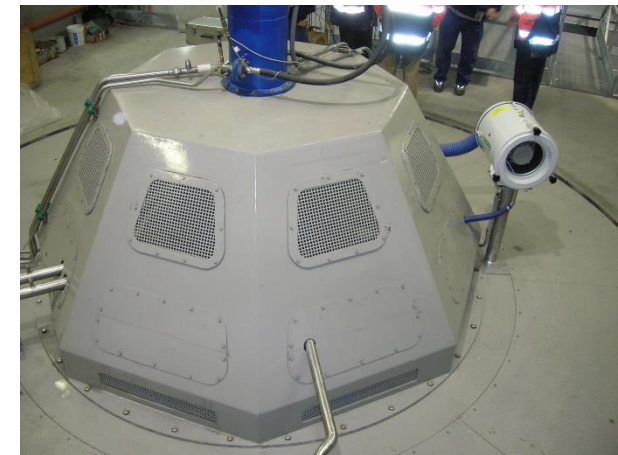
Works completed



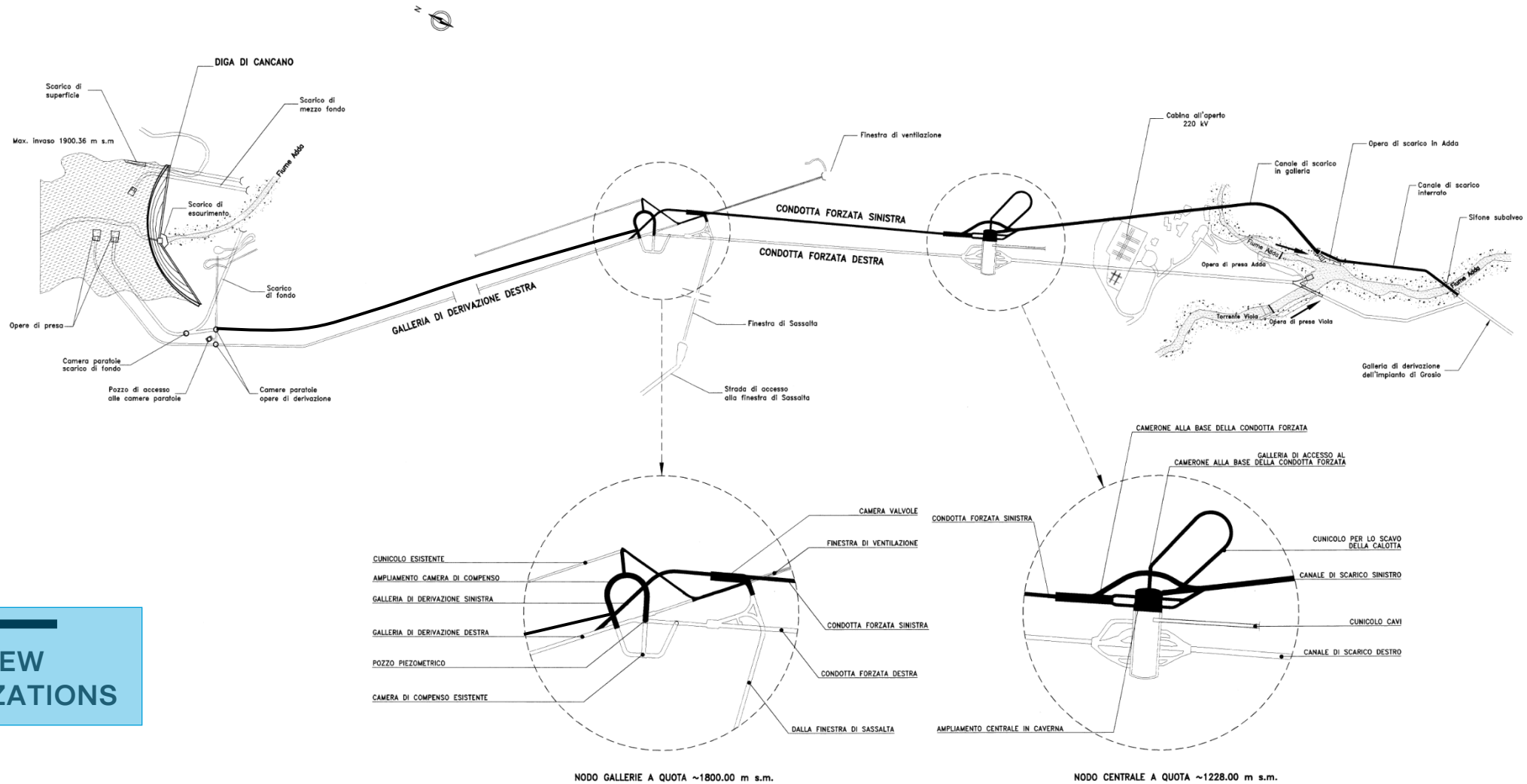
During construction



Works completed

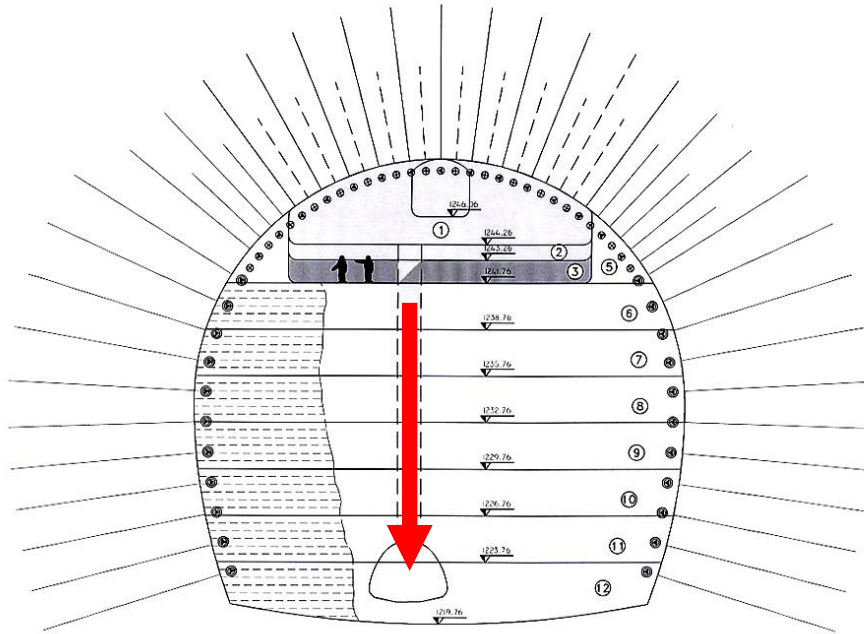


10 MW – 25 GWh/year  
Turbine and Generator



NEW  
REALIZATIONS

~6 km of new water tunnels



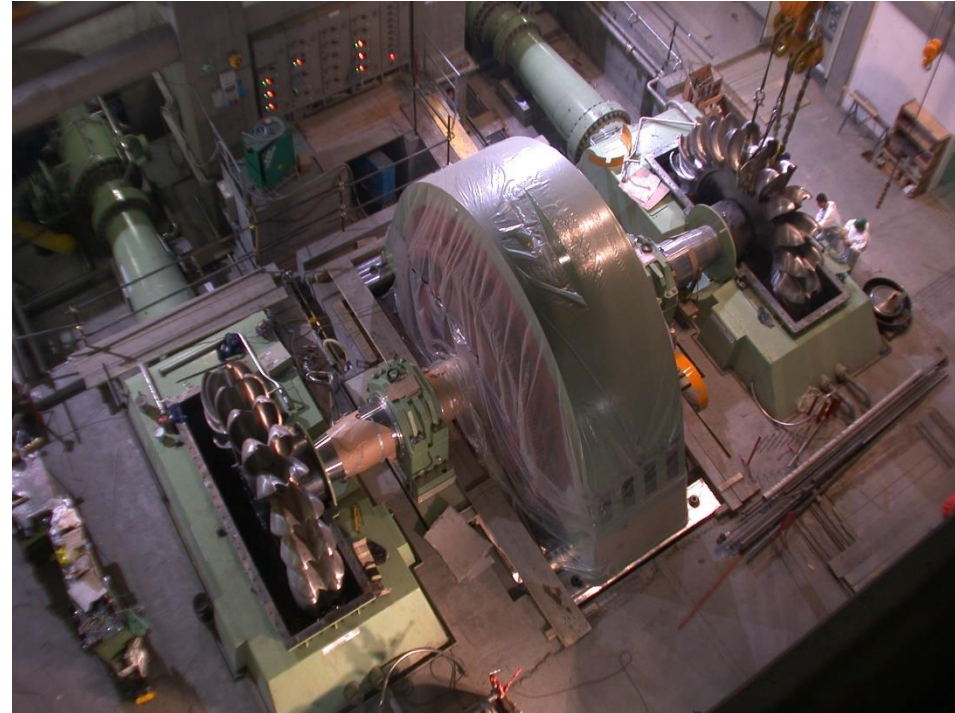
Extension of powerhouse in cavern—  
vertical section 900 m<sup>2</sup>  
(30m x 30 m)



Excavation by roadheader



Extension of powerhouse in cavern



3rd Generation Unit - 80 MW  
with two Pelton runners

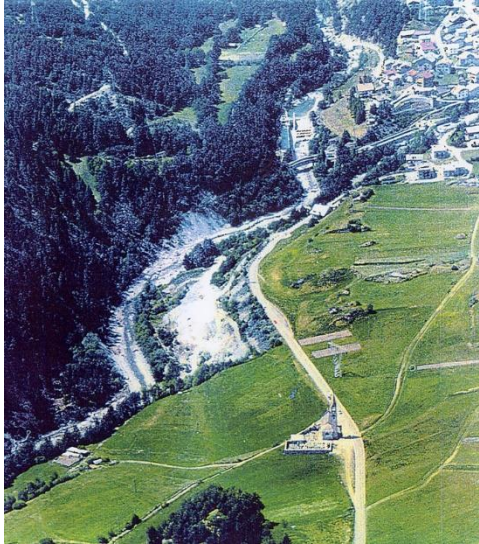


Installation of the 4th Generation Unit - 110 MW

# SOME EXAMPLES OF ENVIRONMENTAL SUSTAINABILITY

Premadio: San Gallo landfill reclamation

Before



After



Nuovo Canale Viola: old quarry reclamation



San Giacomo dam after new constructions



San Giacomo HPP after construction

