



# Power Stations

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**Water power stations**

# Introduction

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- **Hydroelectricity** - [electricity](#) generated by [hydropower](#)
- Production of electrical power through the use of the gravitational force of falling or flowing water.
- It is the most widely used form of [renewable energy](#).
- 16 percent of global electricity generation – 3,427 terawatt-hours of electricity production in 2010.
- It is expected to increase about 3.1% each year for the next 25 years.

# Generating methods

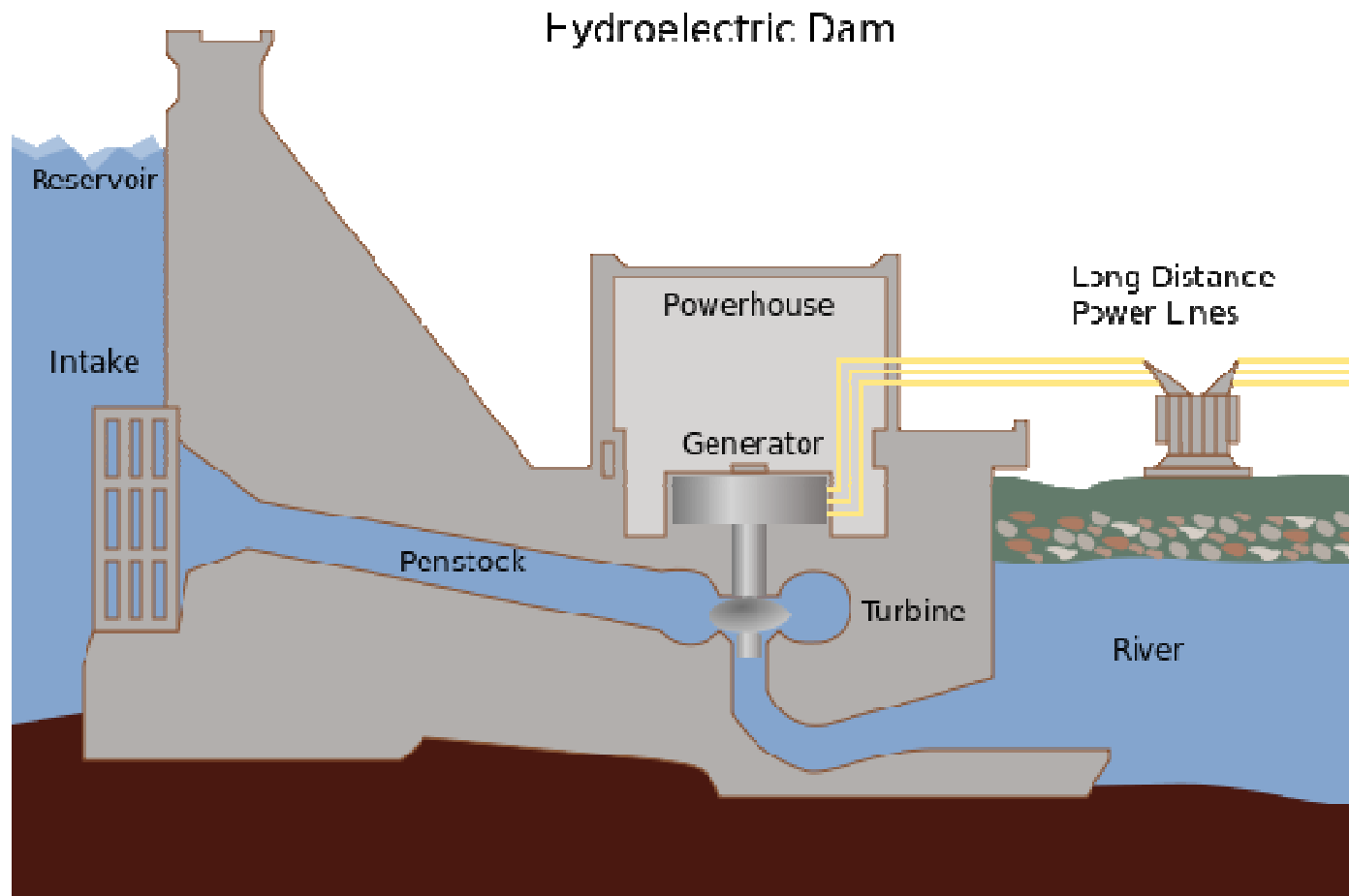
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- Conventional (dams)
- Pumped-storage
- Run-of-the-river
- Tide

# Cross section

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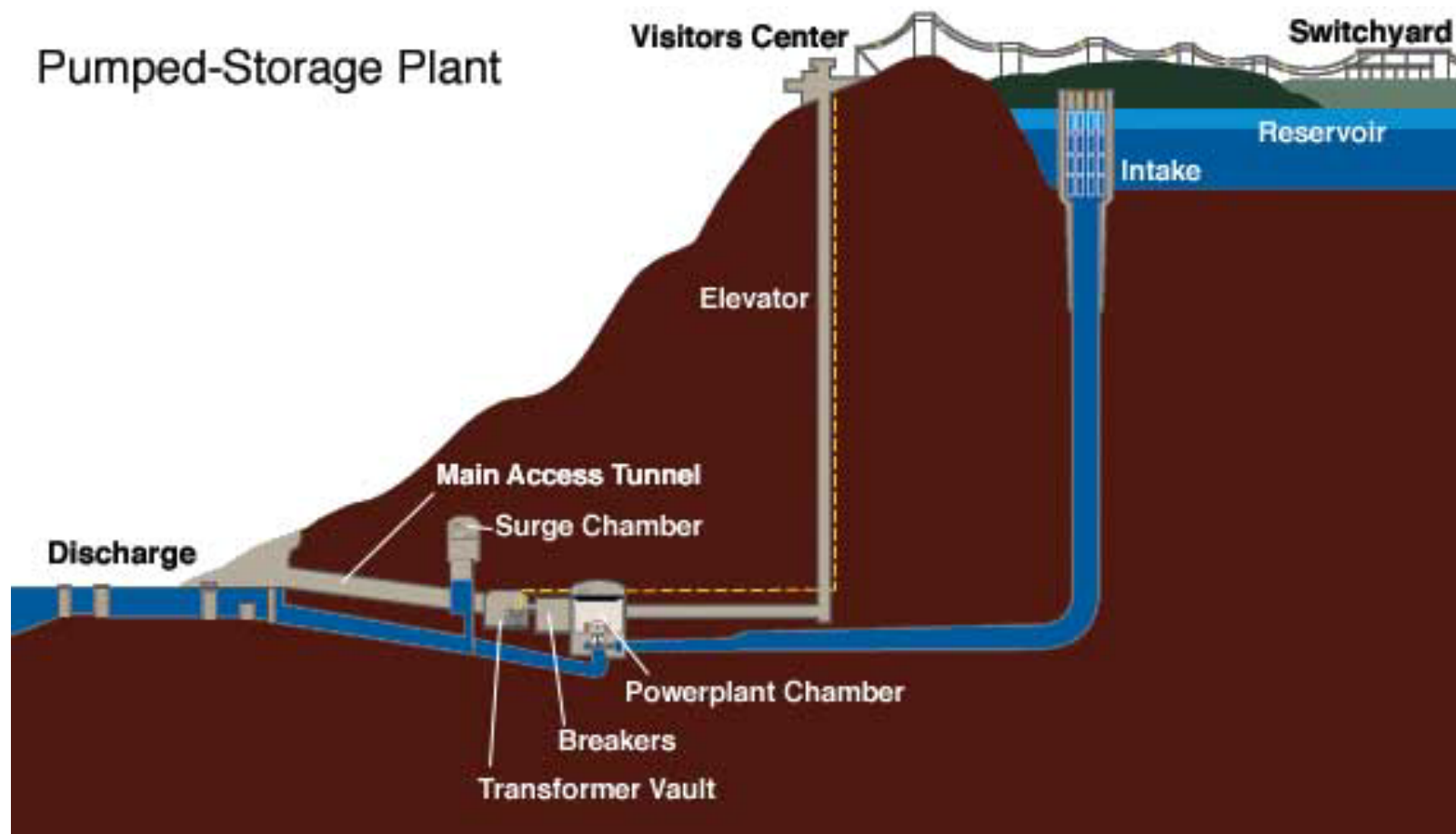
- Cross section of a conventional hydroelectric dam



# Cross section

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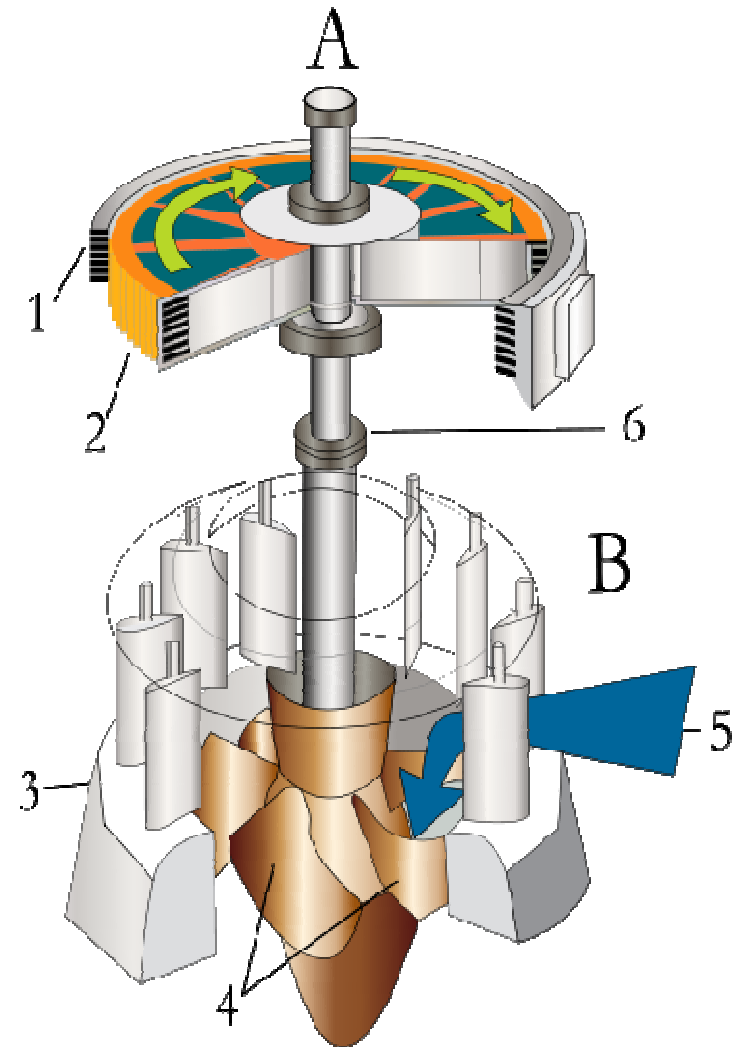
- Cross section of a hydroelectric “battery”



# Turbine and generator

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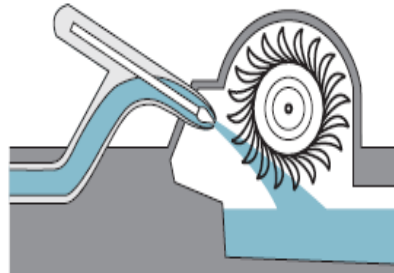
- Hydraulic turbine and electrical generator, cutaway view. A : Generator; B : Turbine; 1 : Stator, 2 : Rotor, 3 : Wicket gate, 4 : Turbine blade, 5 : Water flow, 6 : Turbine generator shaft.



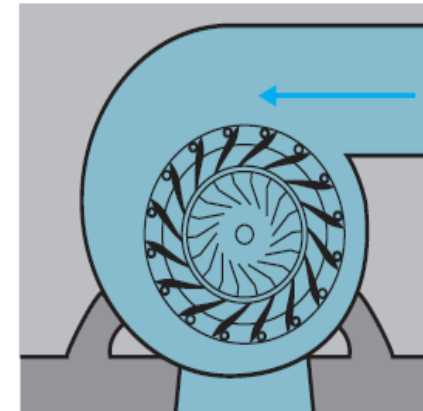
# Types of water turbines

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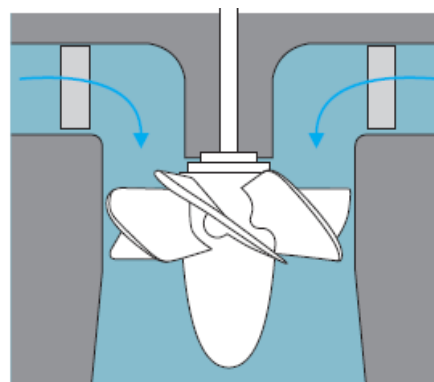
- Pelton Turbine



- Francis Turbine



- Kaplan Turbine



# Design and application

- Kaplan  $20 < H < 40$
- Francis  $10 < H < 350$
- Pelton  $50 < H < 1300$

