

Water Resources Engineering and Management

(CIVIL-466, A.Y. 2024-2025)

5 ETCS, Master course

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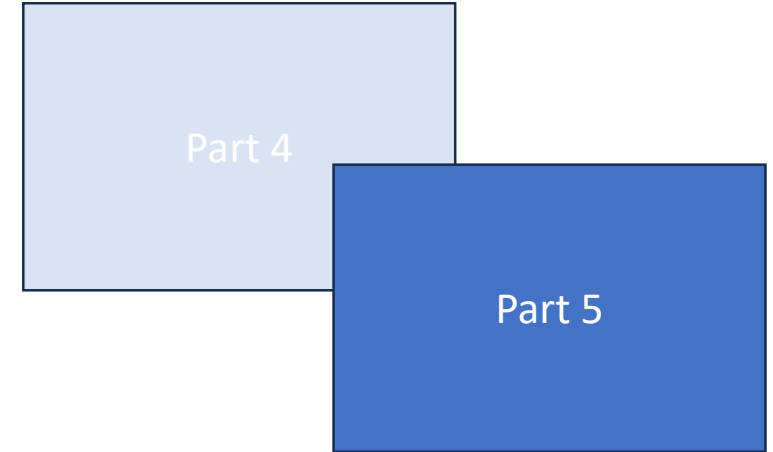
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Practical Work : Case study hydropower
optimal water allocation and financial study

Content and Goals

- Define **cashflows** of a hydropower project
- Develop **discounted cashflow model**
- Perform **economic analysis** by defining corresponding IRR and NPV
- Perform **financial analysis** and assess project from investors' and lenders' point of view



Case Study – Economic Assessment

Assumptions:

Cost disbursement:

- Start of year 1: 10%
- Mid of year 1: 25%
- Mid of year 2: 30%
- Mid of year 3: 35%

Discount rate: 6%

Construction time: 3 years

Case Study – Financial Assessment

Assumptions:

Debt-equity ratio: 70%/30%

Interest on debt: 5%

Loan maturity: 8 years

Depreciation period: 20 years

Taxes on revenue: 10%

Tax holiday: 0 years

Project tasks (Week13 – 19/05/2025)

Your tasks today:

Use spreadsheet: [WREM-project_4_for students.xlsx](#)

Exercise 4.3A:

Define the project cashflows and prepare the discounted cashflow model.

Exercise 4.3B:

Define economic IRR and NPV for both alternatives.

Exercise 4.3C:

Compare the two alternatives in regard of IRR and NPV and discuss their economic attractiveness.

Exercise 5.1A:

Define Free Cash Flow to Equity (FCFE) and prepare discounted cashflow model including loan payments, depreciation and taxes for both alternatives.

Exercise 5.1B:

Define FCFE IRR and NPV for both alternatives.

Exercise 5.1C:

Define DCR for the loan period for both alternatives.

Exercise 5.1D:

Compare the two alternatives from investors' and lenders' point of view.