

Assessing the economic rationale of small-scale dam removal

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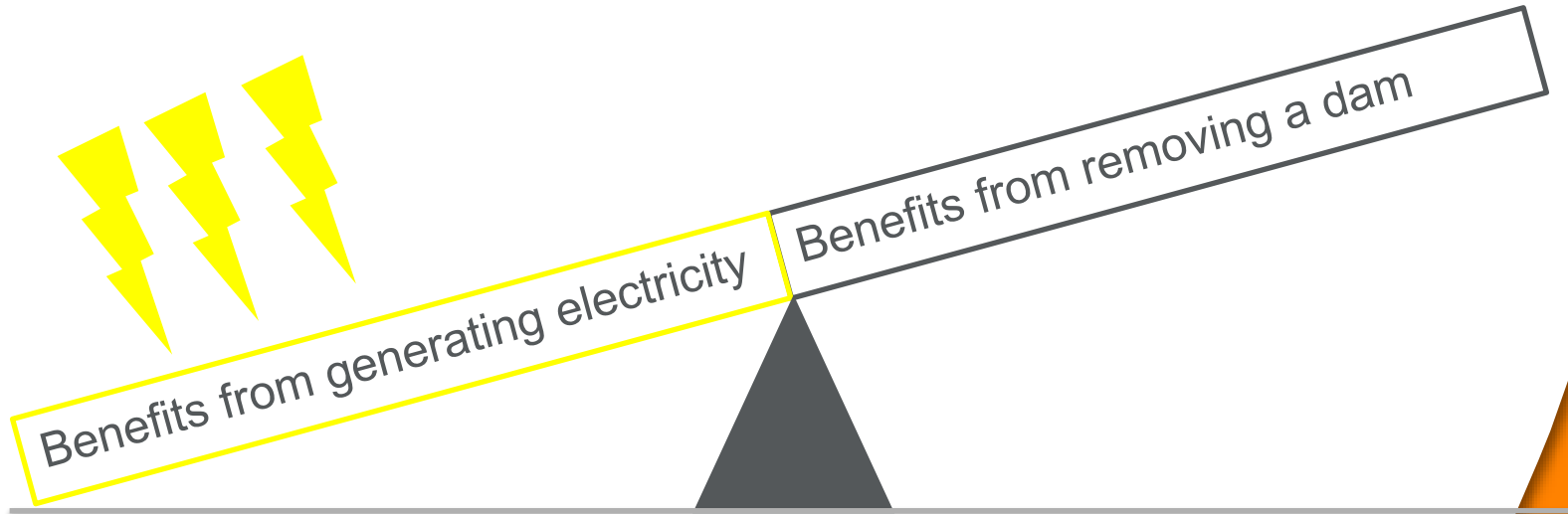


Economics of dam removal

Benefits from generating electricity

Benefits from removing a dam

Economics of dam removal



Economics of dam removal

Benefits from generating electricity

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Economics of dam removal

Benefits from generating electricity

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Benefits of removing a dam and restoring the river

Market values

- White water sports
- Fishing tourism
- Nature tourism
- Increase in property values
- Employment effects

→ Not trivial to estimate (time frame, fish stock dynamics, region's 1st or 100th removal, ...)

Non-market values

- Strengthening biodiversity
- Protecting endangered species
- Aesthetic values
- Recreational opportunities; local, regional and national

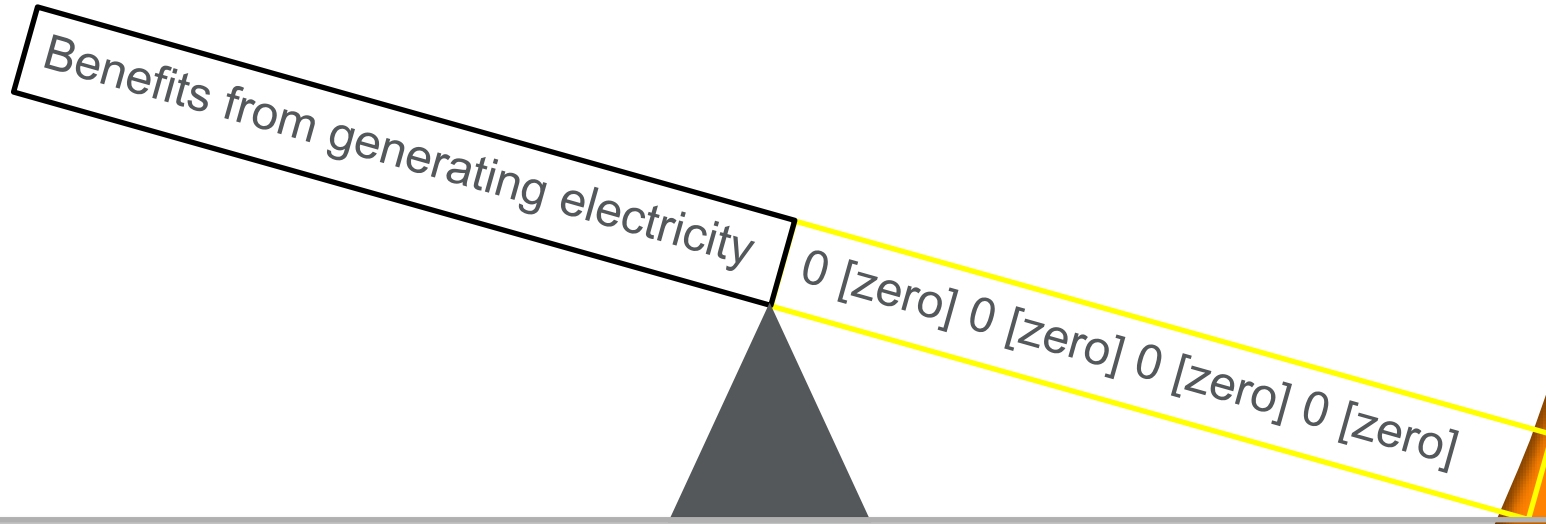
→ Expensive and difficult to estimate (all problems of estimating market values + many new ones)

So what if...

Benefits from generating electricity

0 [zero] 0 [zero] 0 [zero] 0 [zero]

So what if...and yet



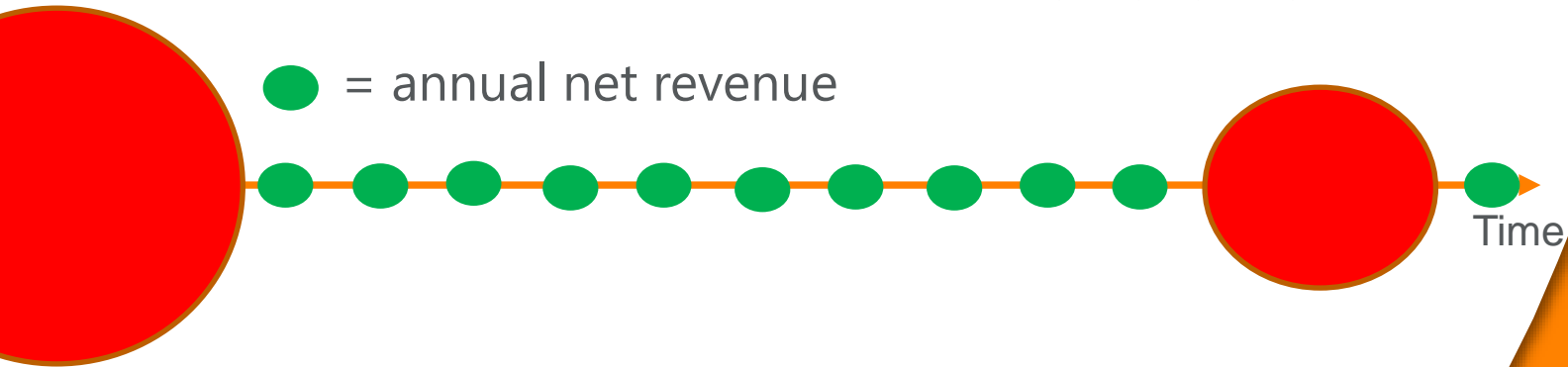
How could a value of a hydropower plant be < 0 ?

Economic structure of a plant

Initial investment

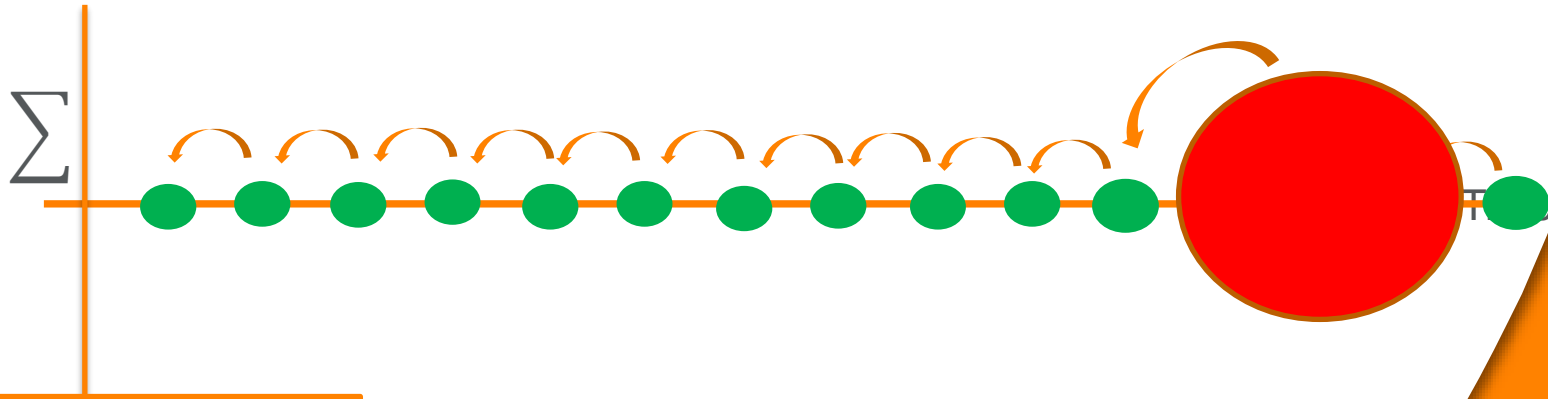
A big investment that needs to be done every now and then

● = annual net revenue



Economics of a plant in a single number – Net present value

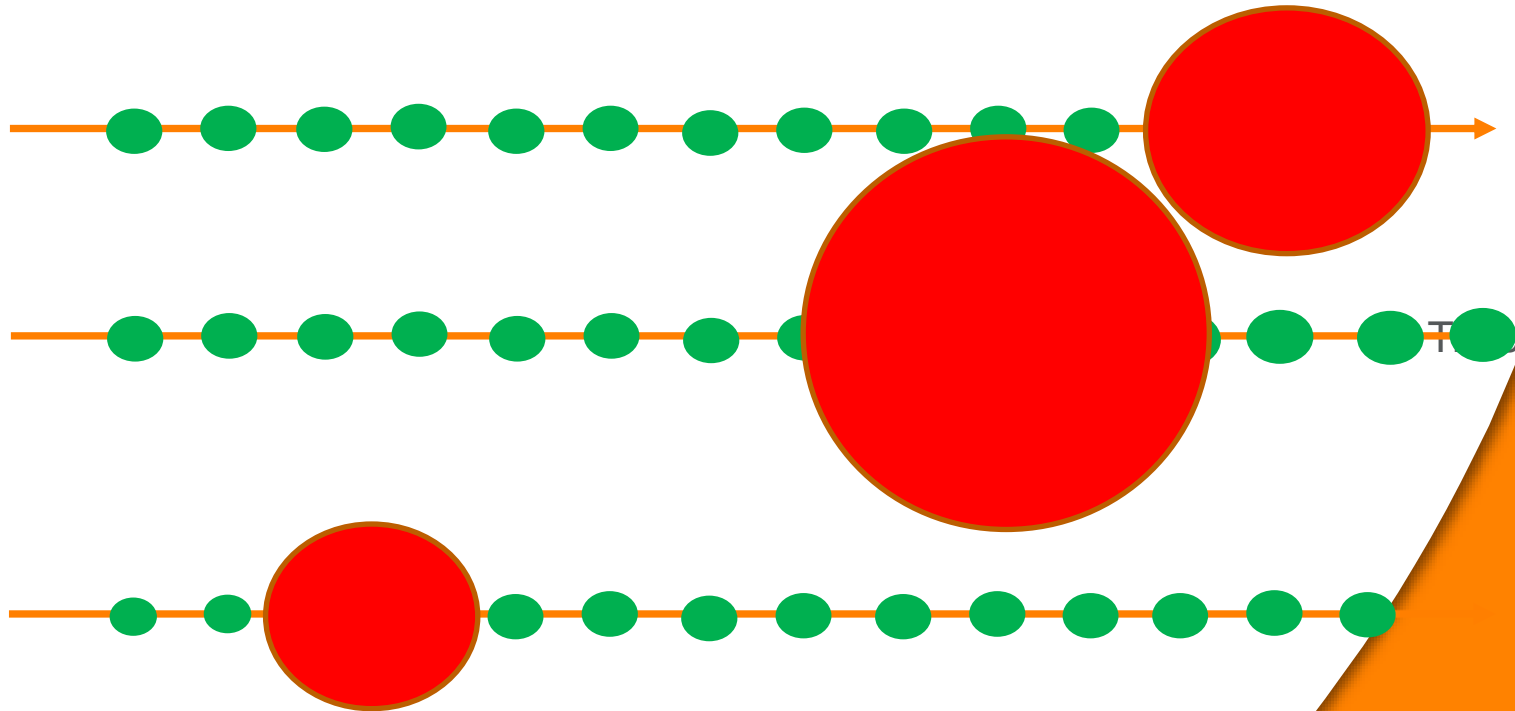
Discount all future revenues and costs to current time and sum them up → Net present value (NPV)



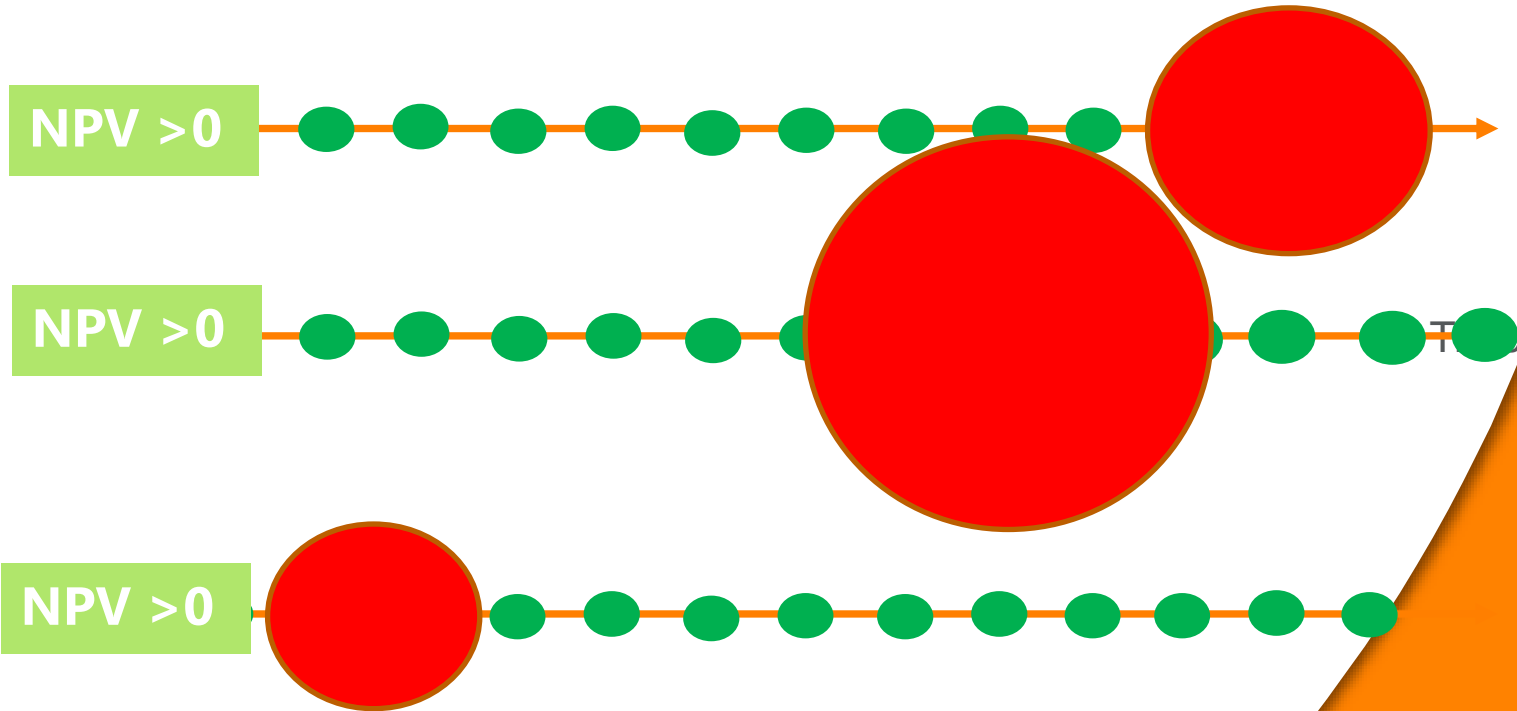
Current time

NPV reflects the long term economic status of the plant

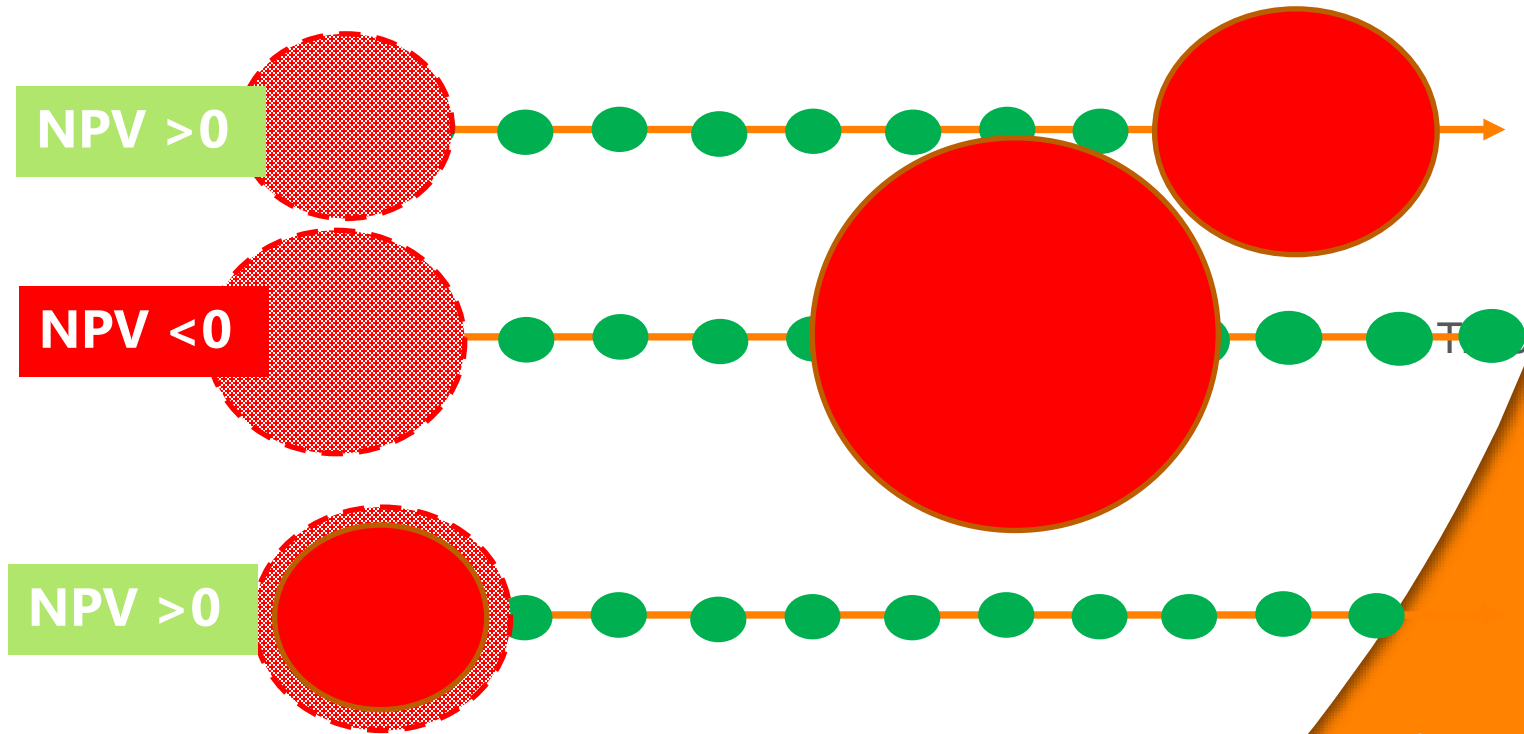
Ok. But why unprofitable?



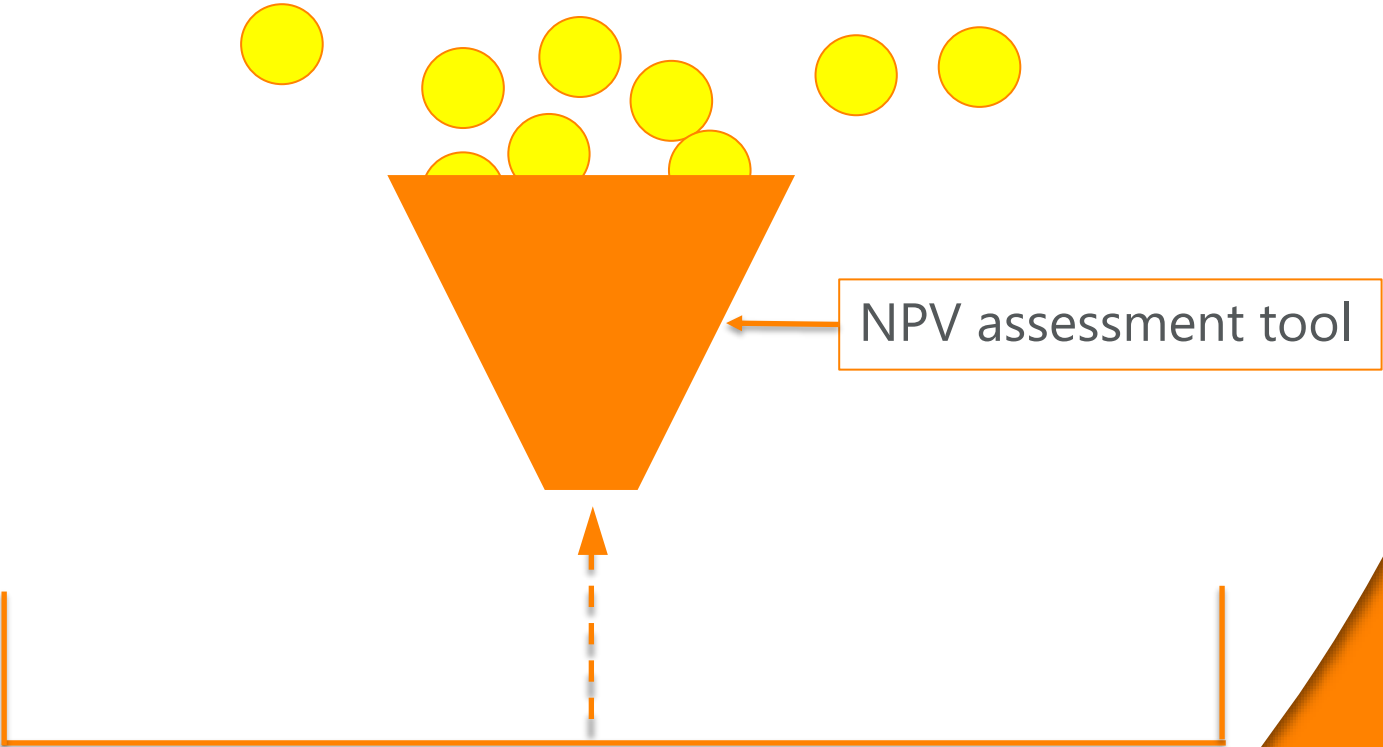
Let's calculate the NPVs



Require a fish passage

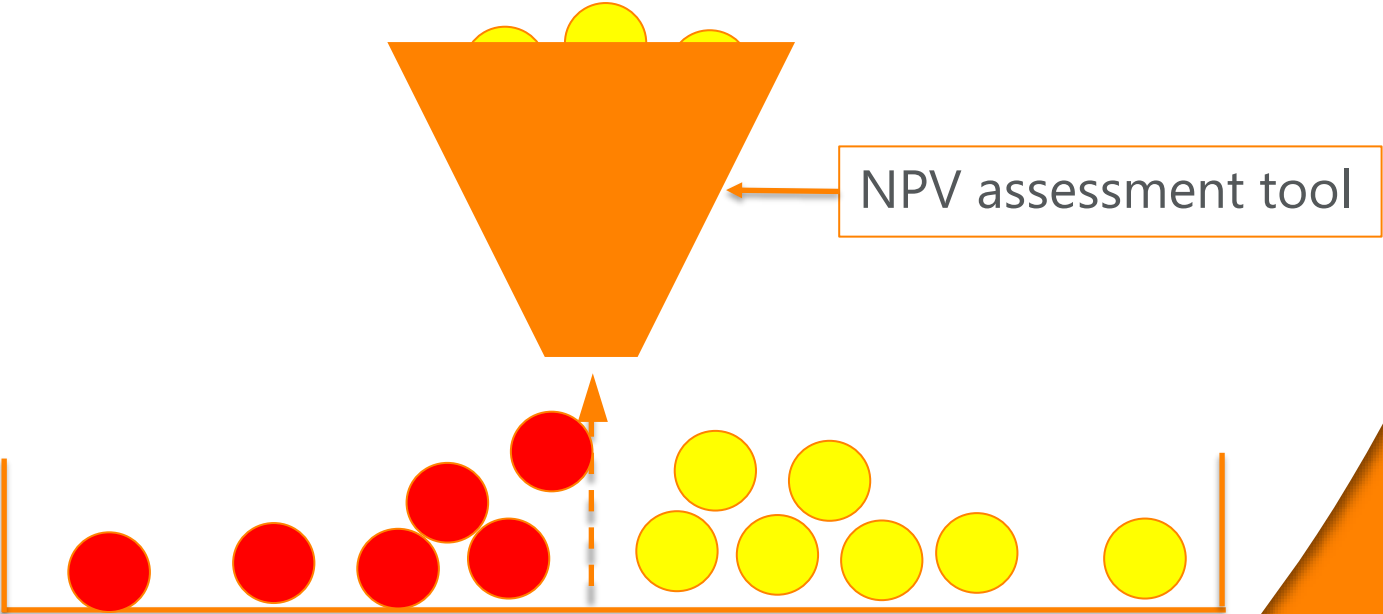


Finland, 220 business-like hydropower plants – 100 smallest ones total power 70MW



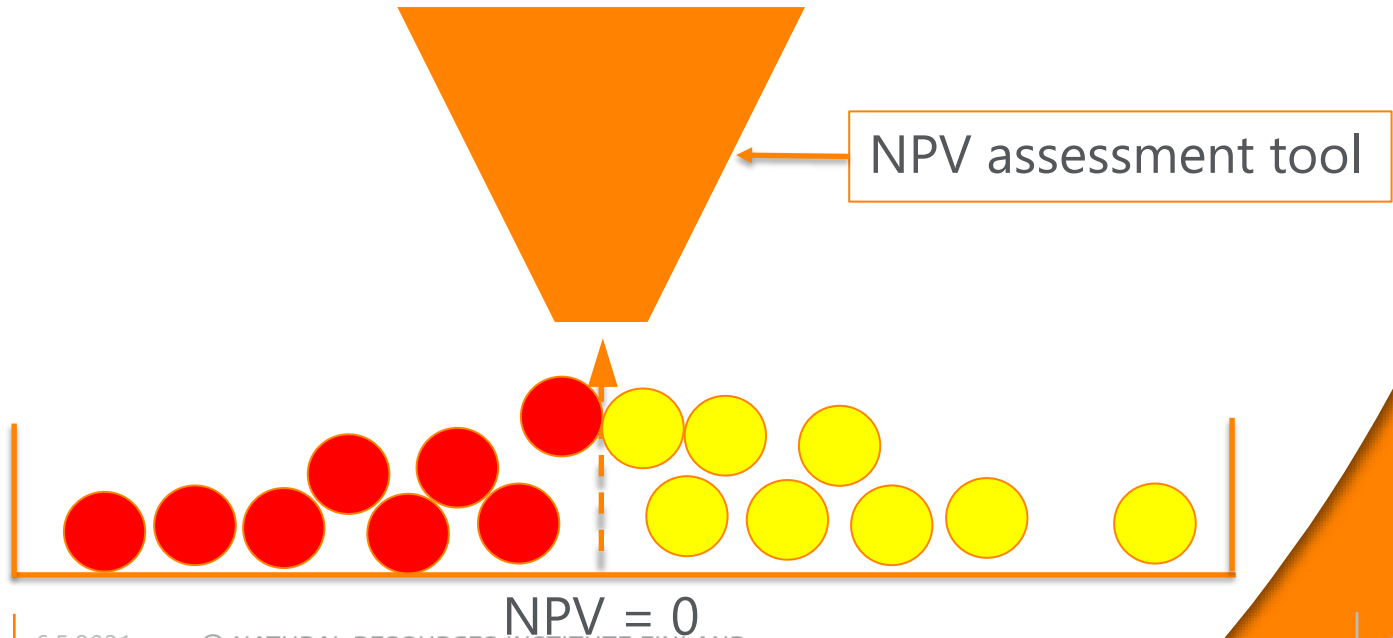
NPV = 0

Finland, 220 business-like hydropower plants – 100 smallest ones total power 70MW

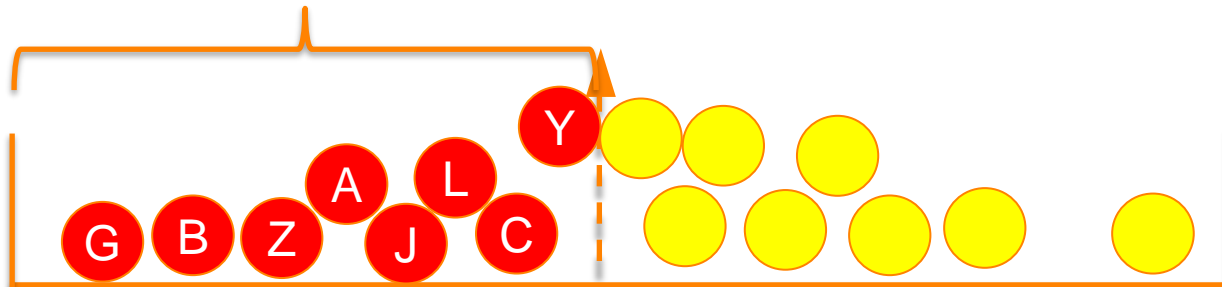


NPV = 0

Finland, 220 business-like hydropower plants – 100 smallest ones total power 70MW

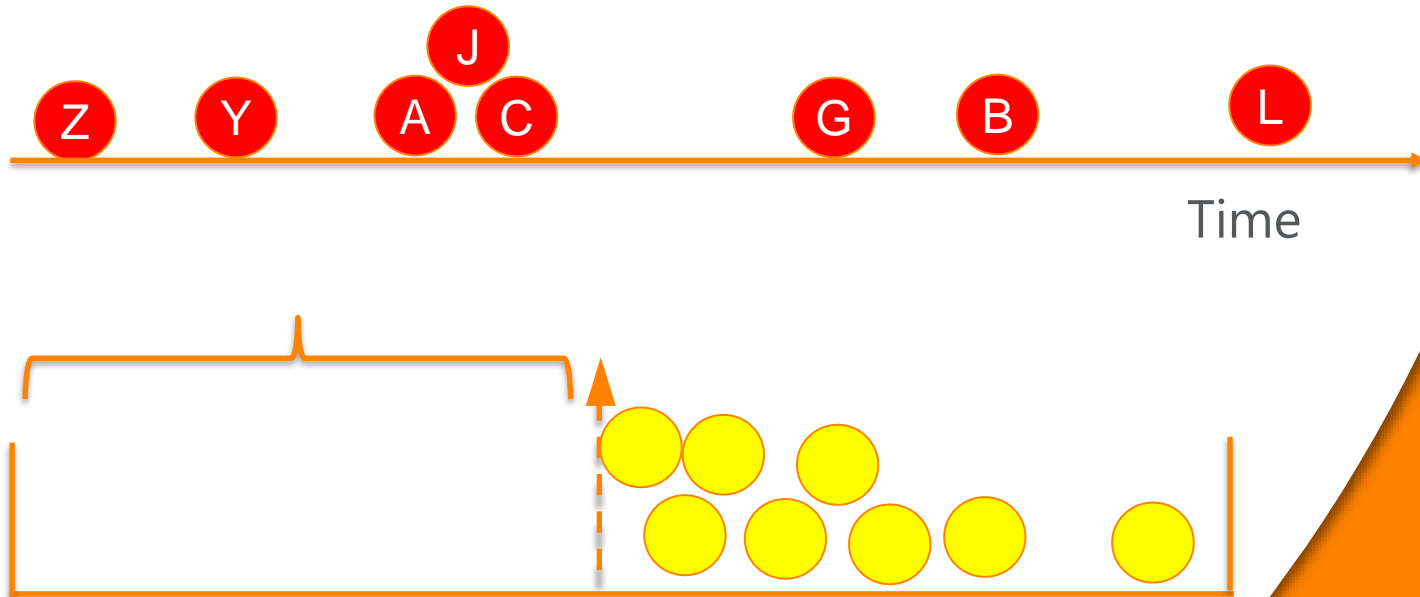


Unprofitable in the long run typically profitable in the short run → schedule the red pool

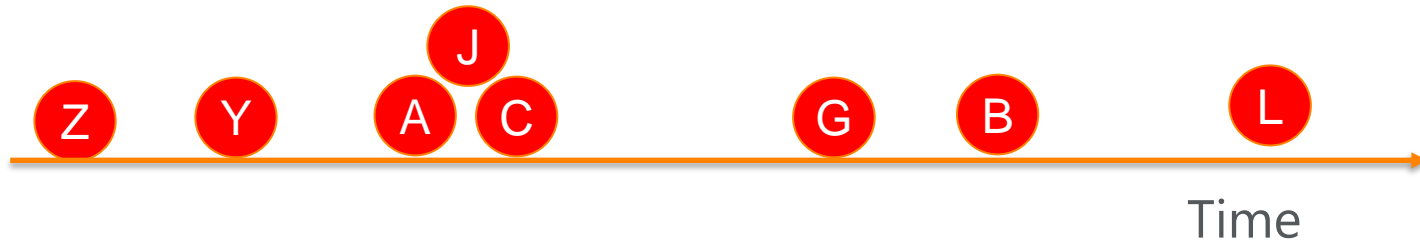


NPV = 0

Unprofitable in the long run typically profitable in the short run → schedule the red pool



Initiate the process with these plants



- Negotiations with the owner (NPV assessment tool helps)
- Regulatory process
- Financing
- Ecological planning
- Contracting

NPV Assessment tool? Data needs?

Useful for professional plants with good information on:

- Investment needs
 - Timing, life-span, efficiency gains, etc
- Cost structures
- Revenue stream

Natural Resources Institute Finland will upload an NPV tool on its web pages this Fall. English version most likely made available as well.

Kiitos –Thank you!

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