

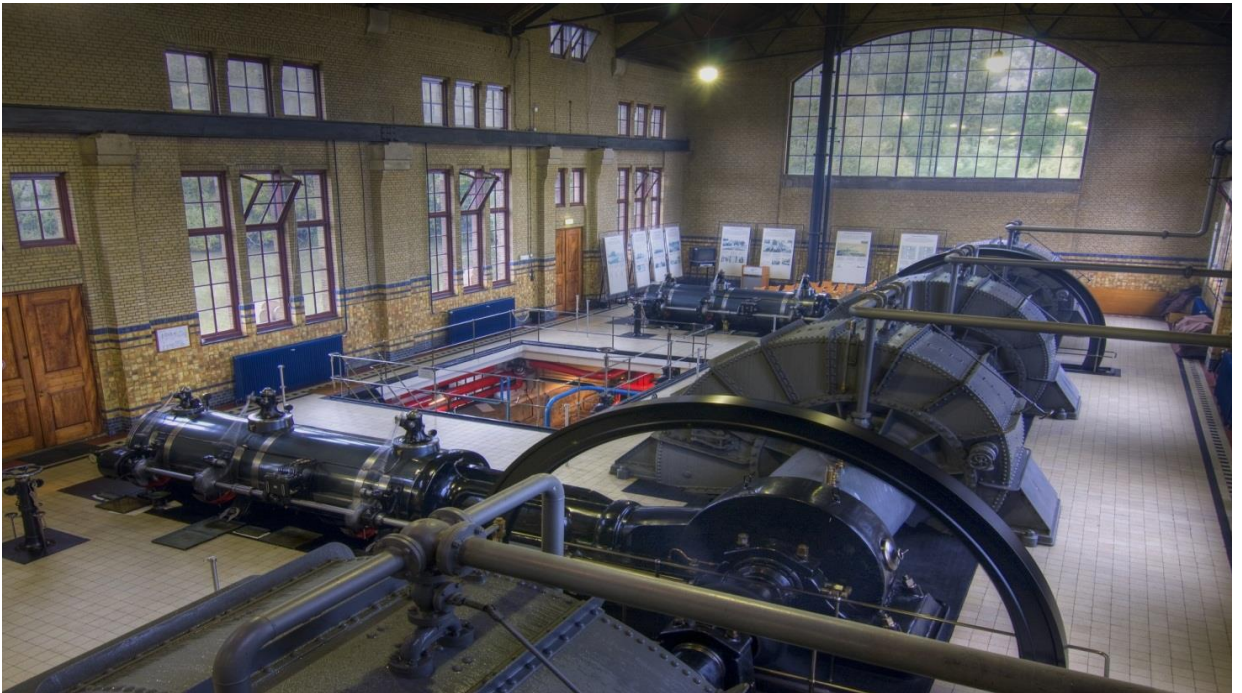
# Role of Ir. D.F. Wouda pumping station in contemporary watermanagement



## Agenda

- Introduction
- Water system in Fryslân
- Heritage and Economics





## Introduction (1)

- Largest still working steam driven pumping station in the world, working since 1922
- Unesco Heritage since 1998
- Necessary for water management in Fryslân
- Last year 34 thousands visitors

  
WATTERSKIP  
FRYSLÂN

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## Introduction (2)

- Visitors centrum

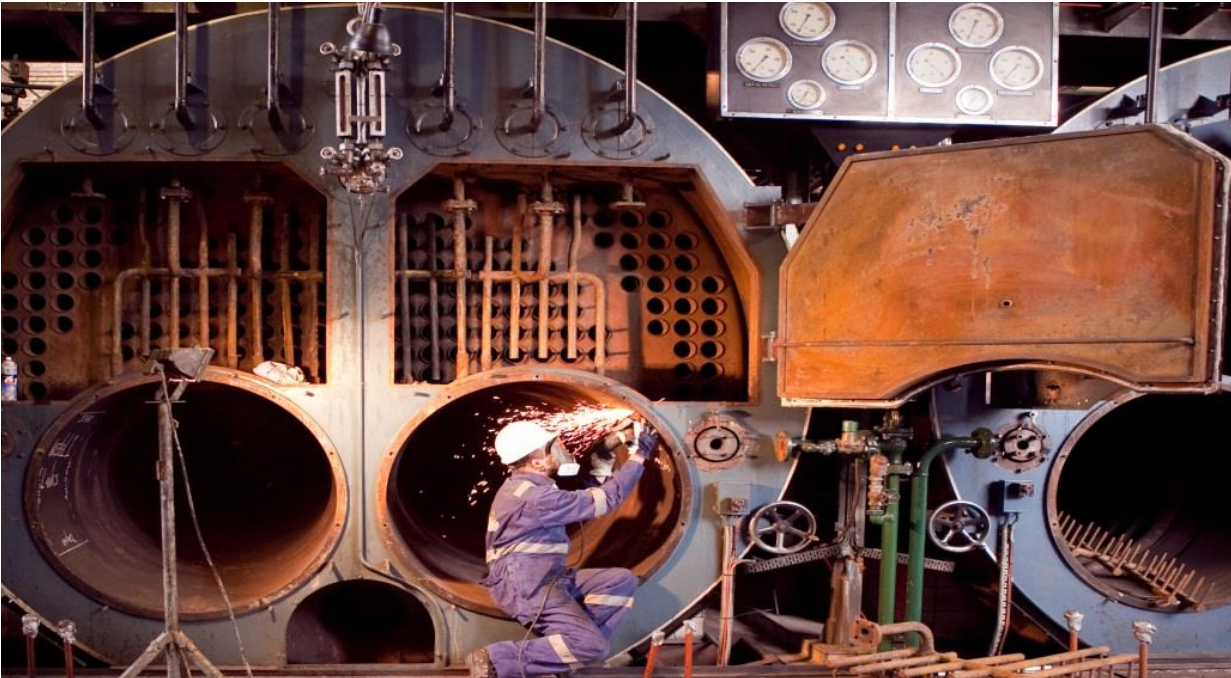




## Introduction (3)

- Reconstruction of 8,4 mln euro
- Finished tomorrow
- 20% subsidised by the national authorities
- Rest for the water board, payed by the inhabitants of Fryslân





## Introduction (4)

- Important role in water system Fryslân
- Stand alone operation possible
- In operation by 13 trained employees of Water board Fryslân
- For visitors 100 volunteers
- With staff for professional support of 6 people



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## Introduction (5)

- Side effects:
  - Flagship in education of water in Fryslân
  - Youth getting involving in water
  - 10% of visitors below the age of 16



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## Introduction (6)

- Big capacity: This conference room is full of water. Question: How long will it take for the “Wouda” to get rid of the water? 3,5 d/h/m etc

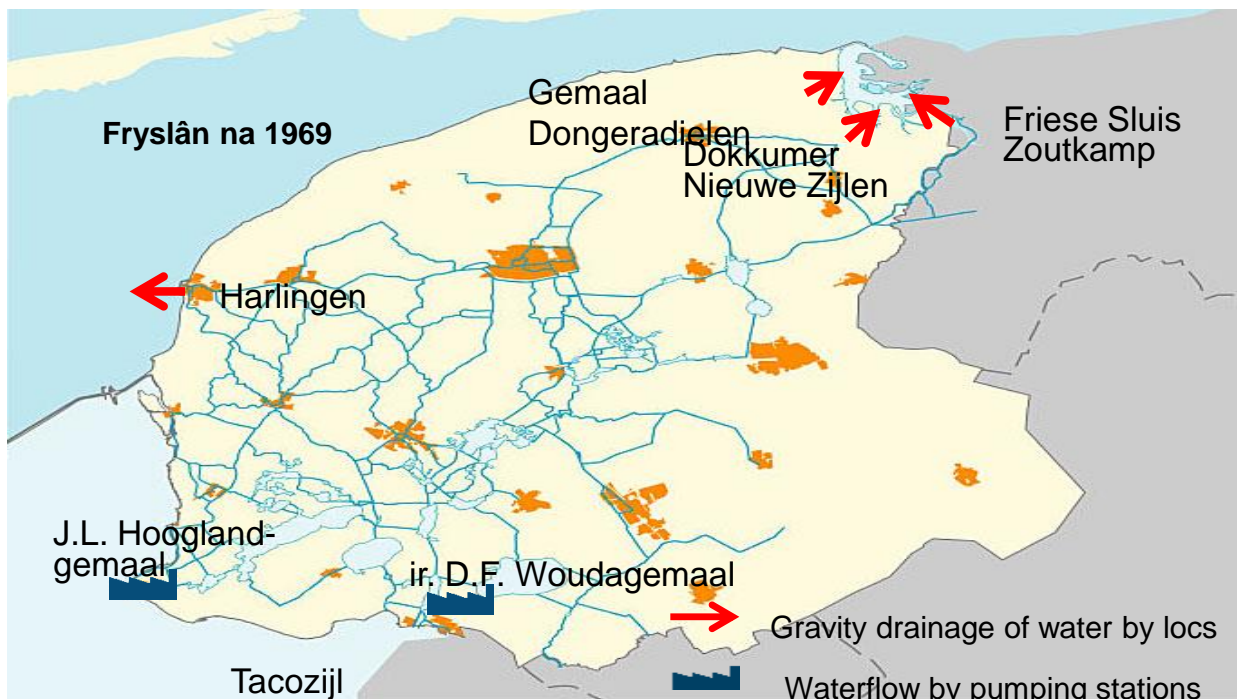


# Watersystem in Fryslân (1)

- Most part (60%) of Fryslân below sealevel
- Simply: water in = water out
- Water out:
  - Gravity drainage by "low tide"
  - Pumping
  - Postponing by buffering



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## Watersystem in Fryslân (2)

- Daily balancing water in and out
- Using a model with whether- and tide prediction
- 10 mm rain is 3 mln m<sup>3</sup> water
- Max occurred 28 mln m<sup>3</sup> a day
- Gravity drainage: 7 mln m<sup>3</sup> a day
- Hoogland: 10 mln m<sup>3</sup> a day
- Wouda: 6 mln m<sup>3</sup> a day (25.000 times this conference room)



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## Heritage and Economics (1)

- Gravity drainage – electrical pumping – steam pumping, daily operational cost increase
- During wet periods mostly no gravity drainage
- On annual basis:
  - 80% of wetter by gravity drainage
  - 60 days operations of Hoogland
  - 6 days operations of Wouda



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## Heritage and Economics (2)

- Take annual depreciation in consideration
- Wouda exists nearly 100 year
- Depreciation only of the restoration
- By use of a few days a year, low cost of operation
- “the rolls of granddad”
- Economics meets Heritage and Education

## Questions?

