LOGSTOR VALUE PROPOSITION Sapporo 2019

Tommy Lorenzen

LOGSTOR's concept for DHC

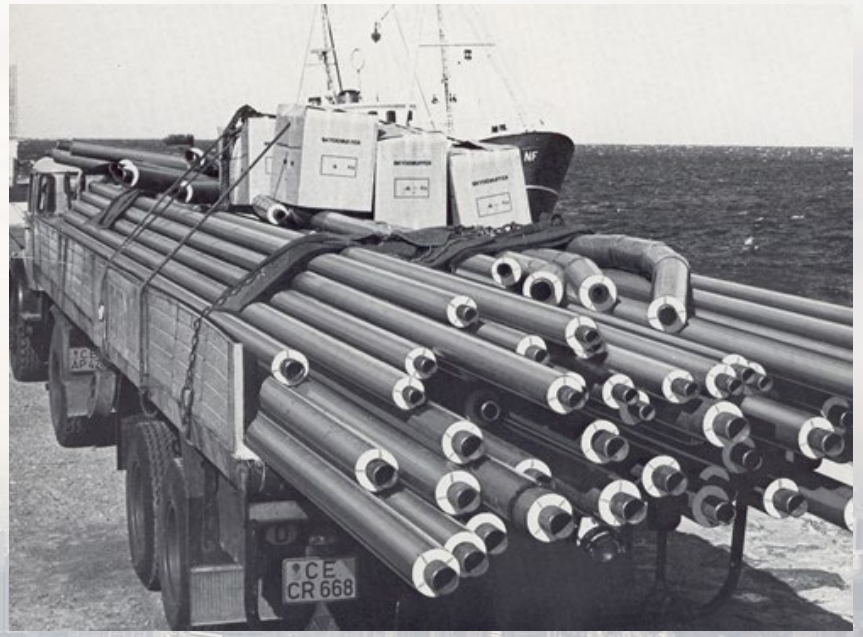
In 1959 something happened ...

Ege Andersen

Mr. Ege Andersen, managing a plumbing and coppersmith company in the small city of Løgstør found in the late 1950th a way to put a steel pipe in a casing pipe an insulate the space between the pipes with PU-foam.

The pre-insulated pipe was invented.

He founded a company called **LØGSTØR RØRindustri** today known as **LOGSTOR.**



- *We invented the buried pre-insulated pipe technology*

Global presence

LOGSTOR Group

- Headquarters in Denmark
- 1,300 employees
- Annual turnover > 220 MEUR
- Owner: Triton Fund III

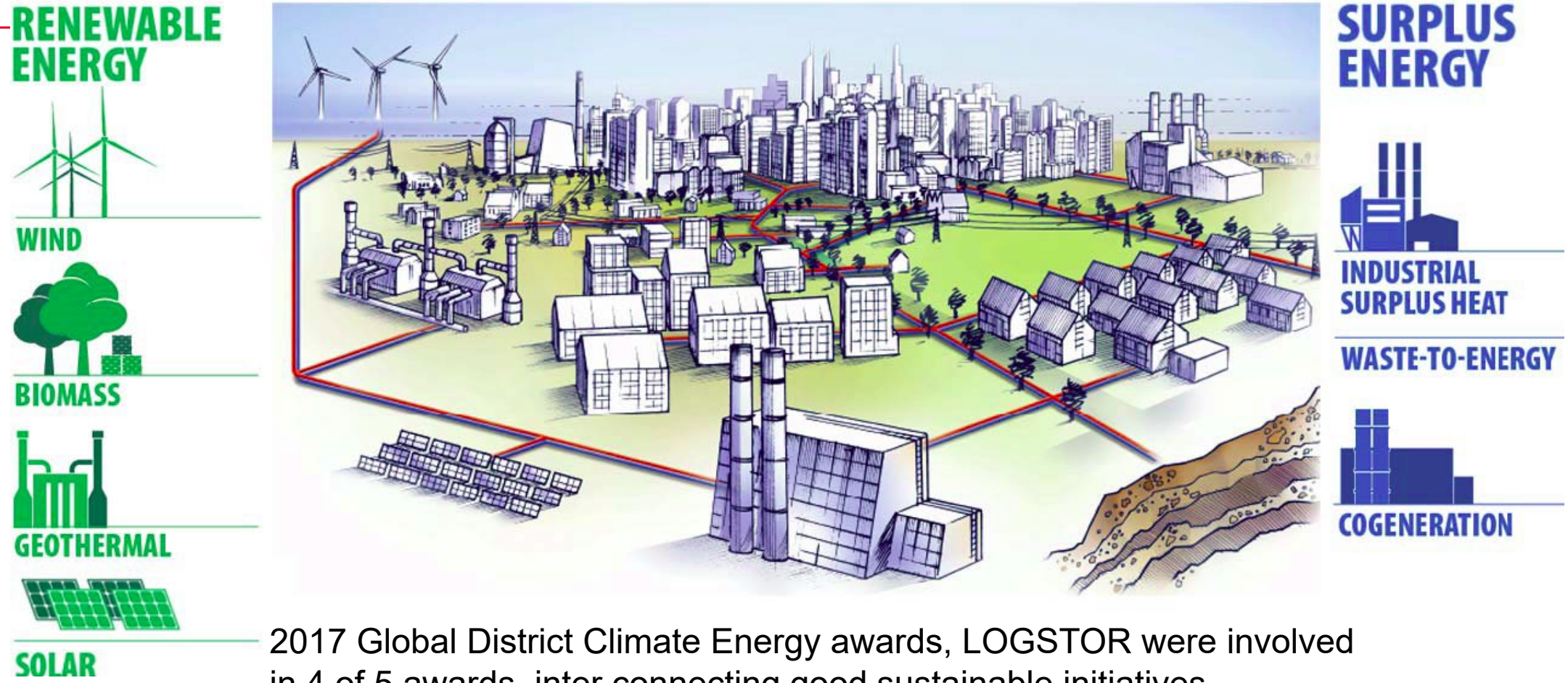
Facts:

- 9 plants and 2 mobile production units
- 13 Sales Units
- Joint Venture in Dubai
- Distributors in more than 30 countries
- More than 4,000 km pre-insulated pipes every year
- More than 200,000 km LOGSTOR pipes supplied to data
- Since February 2017 Powerpipe/Sweden belongs to the LOGSTOR Group

Flexibility, provided by DHC networks

LOGSTOR

- **District energy distribution systems for heating and cooling are connecting various energy sources with its consumers**



2017 Global District Climate Energy awards, LOGSTOR were involved in 4 of 5 awards, inter connecting good sustainable initiatives

Construction of the bonded pipe system

The diffusion barrier (optional)

- Aluminium foil
- EVOH
- PVCD

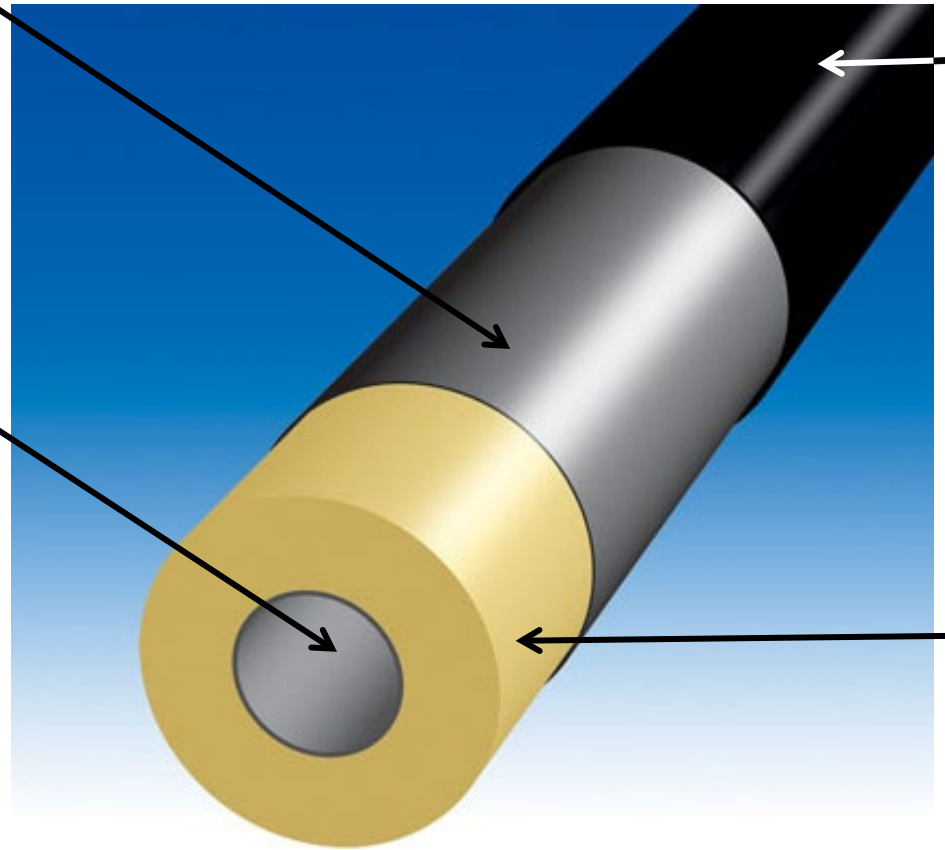
The service pipe:

EN 253 pipe (rigid pipe):

- Steel P235 GH
- Other qualities upon order
- 6, 12 or 16 m lengths

FlexPipes:

- Copper
- Pex
- Alu/Pex
- Steel
- 100 – 200 m coils



The outer casing:

- PE-HD rigid pipes
  Flextra pipes
- LD-PE flex pipes, (smooth casing)

The insulation material:

- Polyurethane (PUR) < 140°C
  - Rigid pipes
  - Flextra pipes
  - Flex pipes (smooth casing)
- PIR < 170°C
  - rigid

Standardized and complete pipesystem with all elements included

With: Preinsulated straight pipe
Preinsulated bends
Preinsulated branches
Preinsulated valves
Connected with joins

Design of Bonded Pipe Systems

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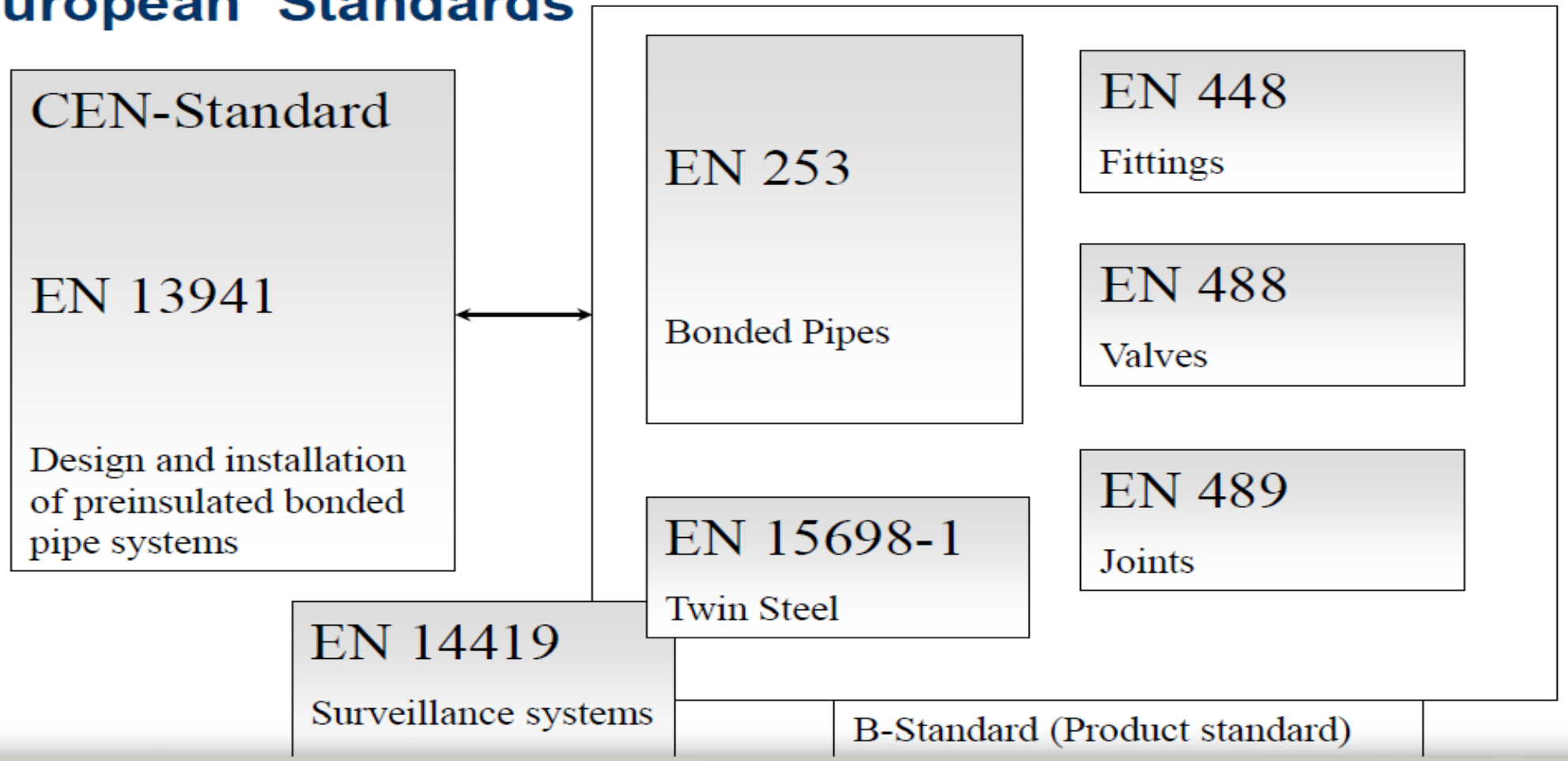
- European Standards

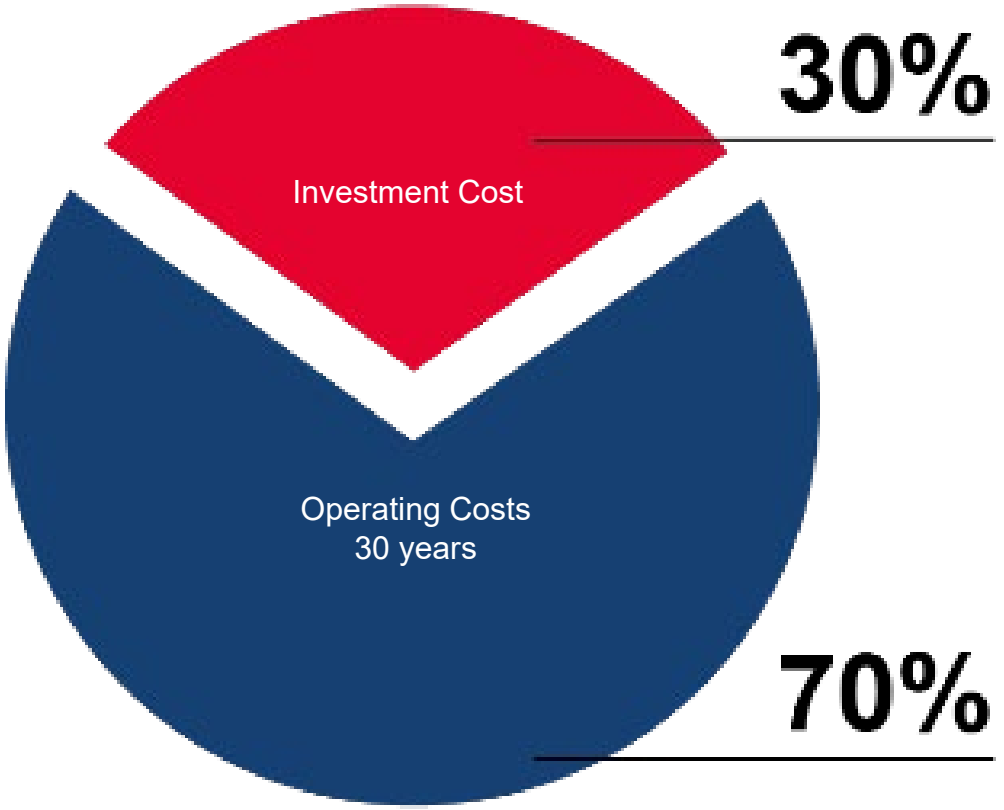


CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Total Cost of Ownership / Lifetime costs

1. **Investment costs (**Non-recurrent costs)
   - Purchase costs, components
   - Installation costs
   - Costs of planning and commissioning
2. **Operating costs** (annual costs)
   - Costs of energy & heat loss
   - Costs of maintenance
   - Costs of repairs
   - Costs of poor quality

3. **Total costs of the solution**



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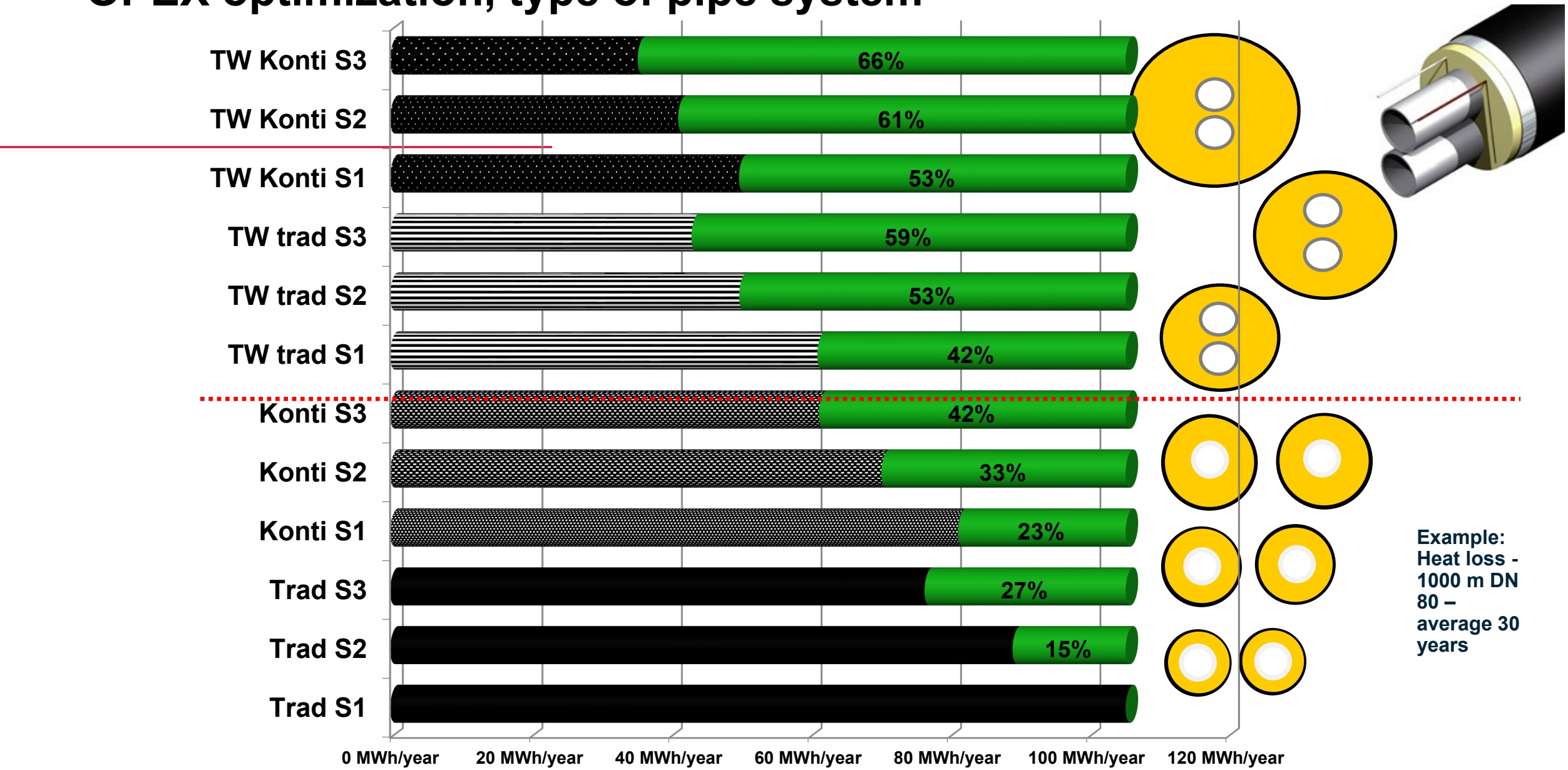
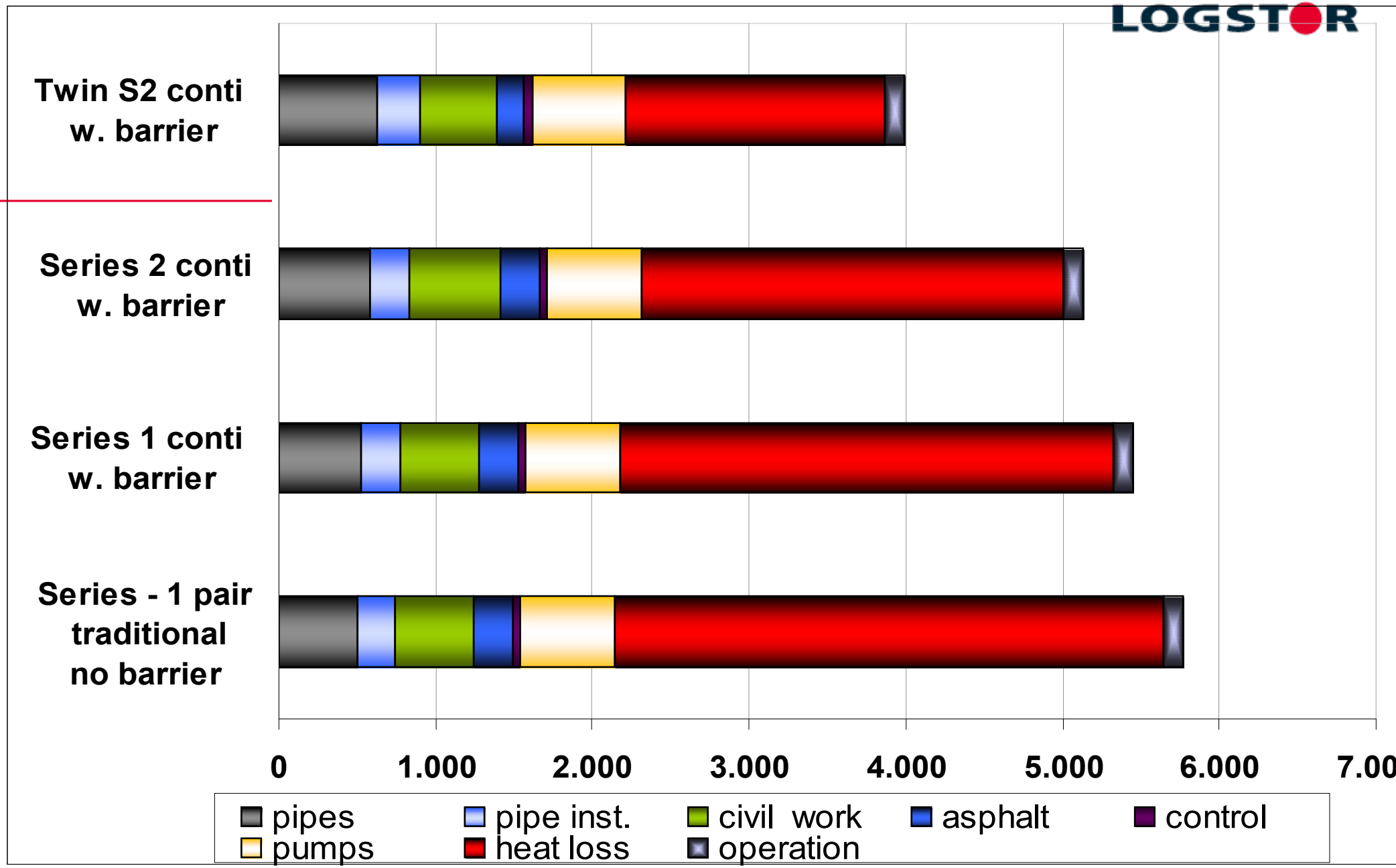
Defining network efficiency

OPEX optimization, type of pipe system



Example: Heat loss - 1000 m DN 80 – average 30 years

OPEX savings



LOGSTOR Calculator

- The tool for correct decision on optimal type of pipe – single, TwinPipe and insulation series
- Optimization in relation to minimizing the heat loss and operational costs, energy efficiency and environmental impact in form of CO2
- Choice of pipe system with lowest total costs of ownership
- Based on the actual parameters for each project
- Comparable calculations for different type of pipes
- Based on the very latest know how about aging of the PUR-insulation foam
- LOGSTOR Design Tool – a new online calculation tool for design of pre-insulated pipe systems

LOGSTOR Calculator

Web based and easy to use tool • Results shown in numerical form and easy-to-read graphs • Aging processes in PUR insulation foam shown in graph form • Any calculation result can be downloaded for your personal use

LOGSTOR Design Services

- The shortest way from energy plant to consumer
- Optimal design is beneficial in all aspects
- Optimal design means less excavation and reduction of the total investment
- LOGSTOR provides documentation, tools and support to optimize your project

Optimal design

Design manual to find the best solution for the specific project • Tools to calculate all details • Curved pipes to ensure shortest pipe run • TwinPipe to reduce excavation and number of joints

Logstor Academy

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Thank you for your attention

Questions?

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Contact: tol@logstor.com

Make sure nothing goes to waste –
use nature's resources thoughtfully