



W-SMART Workshop on Eco-Resiliency & Crisis Management

Eco-disaster case studies

Subtitle

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Eco-Disaster - Veolia's expérience



❖ *USA*

❖ *AUSTRALIA*

❖ *DENMARK*

USA : the New Orléans expérience



❖ *Veolia and Katrina*

❖ *“Resilient New Orleans”*

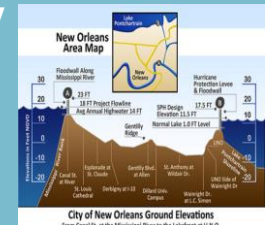
Veolia and Katrina



❖ Hurricane Katrina was:

- ❖ the fifth hurricane of the 2005 Atlantic hurricane season.
- ❖ the costliest natural disaster in the history of the USA (\$108 b - 2005 USD)
- ❖ the deadliest hurricane in the USA since 1928 (at least 1,245 people died)

❖ A City surrounded by water and built under the water level



❖ Veolia was the Waste Water Treatment Plant operator.

Veolia and Katrina

Hurricane Katrina recovery in New Orleans



Plant Flooded



Hurricane Katrina Damage

- ❖ In August 2005 Hurricane Katrina devastated the Gulf Coast and left the East Bank wastewater treatment plant under 20 feet of water
- ❖ Immediate recovery efforts were successful:
 - ❖ *Plant was dewatered after 30 days*
 - ❖ *Plant was receiving 30 MGD after 45 days*
 - ❖ *Secondary treatment was restored after 95 days*
- ❖ **Emergency response actions on our activities to ensure critical aid (water, key infra, temporary housing...)**
- ❖ **Mobilisation of Veolia North America volunteers**
- ❖ **Clean up, disposal, safety audits, repair or upgraded rebuilding**

Resilient New Orleans



A city prepared to withstand and bounce back

Understand
your
vulnerabilities

Plan
your
response

Implement
mitigation
measures

Transfer
your risk

Monitor progress and performance and drive continuous improvement of systems and services

City

Swiss Re helps cities:

- Quantify and prioritize risks
- Identify cost-efficient mitigation measures
- Minimize the financial impact of unforeseen events

Swiss Re

Cities drive innovation and build resilience:

- Reduce unplanned downtime and improved efficiency of operations
- Reduce economic and social impact and losses
- Increase attractiveness and competitiveness

Veolia helps cities

- Plan and implement cost-efficient adaptation and mitigation measures through state-of-the-art solutions in water, energy and waste management
- Prevent and recover from shocks and minimize the impact of stresses

VEOLIA

❖ The first international public-private partnership on resilience between Veolia, Swiss Re, Rockefeller Foundation (100RC Network) and New Orleans

❖ This partnership aims to

- ❖ understand the risk exposure of critical assets under current and future climate scenarios
- ❖ develop resilience plans
- ❖ optimize prevention cost reduce post-event losses
- ❖ reduce the recovery period after a disaster

❖ Study on-going

Australia : the Queensland experience



❖ *Veolia and El Nino*

❖ *Veolia , La Nina , Yasi and Oswald*

Veolia in Queensland - Australia



Of Droughts

And



Flooding Rains



My Country (extract)

I love a sunburnt country,
A land of sweeping plains,
Of ragged mountain ranges,
Of droughts and flooding rains.
I love her far horizons,
I love her jewel-sea,
Her beauty and her terror
The wide brown land for me!



Dorothea Mackeller (1885–1968)

Veolia and El Nino



❖ The Queensland government response to the enduring drought was to build a \$4.5b water grid.

- ❖ Decision made in 2006
- ❖ 12 connected dams
- ❖ 10 connected drinking water treatment plants
- ❖ 3 advanced water treatment plants producing purified recycled water
- ❖ 1 desalination plant
- ❖ 28 water reservoirs
- ❖ 22 bulk water pump stations
- ❖ 535 km of bulk water mains

❖ Veolia's involvement:

- ❖ Design Built and Operate of 250MLD sea water treatment plant (Gold Coast desalination plant)
- ❖ Adviser to the Queensland government for the construction and then operations of the Western Corridor Recycled Water Scheme (232 MLD for industry and Indirect Potable Reuse)
 - ❖ 3 advanced recycled water treatment plant
 - ❖ 200 Km pipeline

Veolia, La Nina , Yasi and Oswald

Using drought relieve facilities during flood events



2011 & 2013 - Cyclones Yasi and Oswald

- ❖ Conventional water treatment plants unable to treat the flood waters being received in their catchments and were forced to stop or significantly reduce production. Many of the plants were inaccessible for operators or supplies.
- ❖ The GCDP was called to operate at 66% and 100% production rates from the 8/1/11 through to the 15/1/11. Varying to meet demand. GCDP supplied respectively 700,000m³ and 520,000m³ during the crisis
- ❖ Water supply was maintained to all consumers throughout the event. No boiled water notices. Some water restrictions were in place.
- ❖ WCRWS was operated to produce PRW for clean-up of the flood damaged property, supplying PRW to tankers which then were used for clean-up (Yasi) .

Impact on Veolia's capacity building in Australia

- Development with the Queensland Government of a Purified Recycled Water regulation
- ISO 22000 Food Safety obtained
- New delivery model (Alliance) due to time pressure
- Process expertise (advanced oxidation -UV with H₂O₂, membranes....)
- Dealing with perception of indirect potable reuse (IPR never happened on the western Corridor as it started raining....)
- Real crisis management
- Acquired knowledge on the WRCWS has been used for a robust recycling project in Antarctica

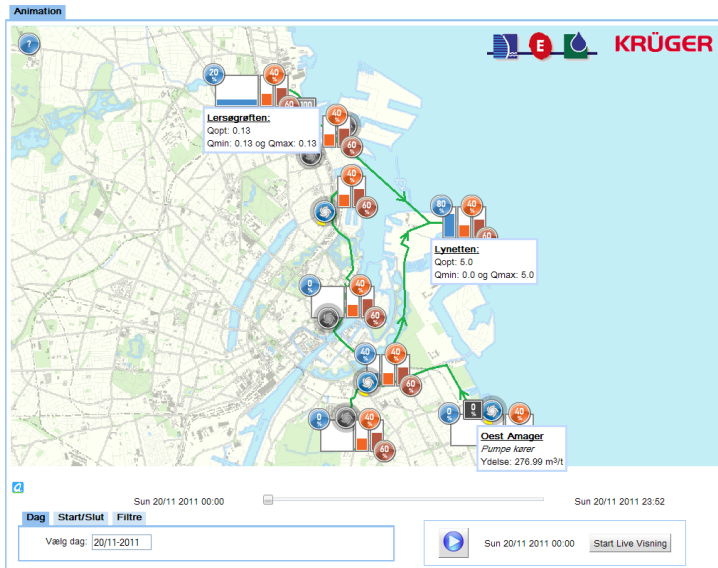
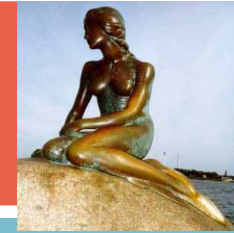
Denmark: Copenhagen experience



❖ *Veolia and the little mermaid*

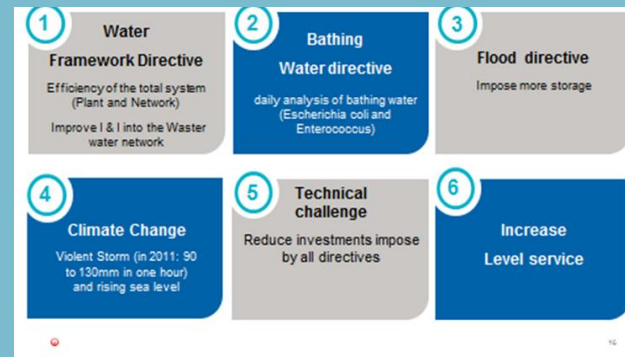
Flood from overflow from urban sewerage system, i.e. “urban pluvial flooding”

Veolia and *The Little Mermaid*



Copenhagen

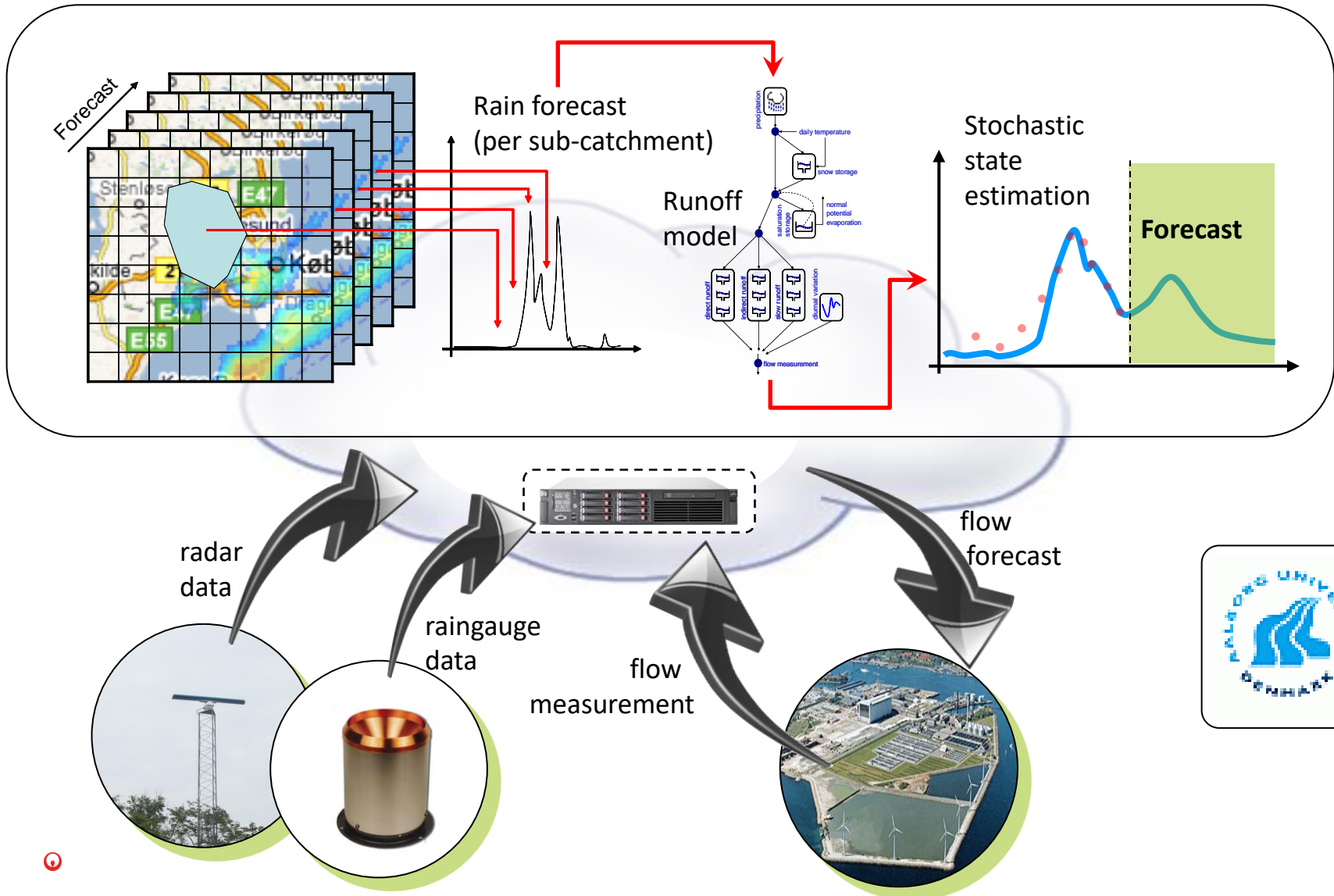
❖ The drivers



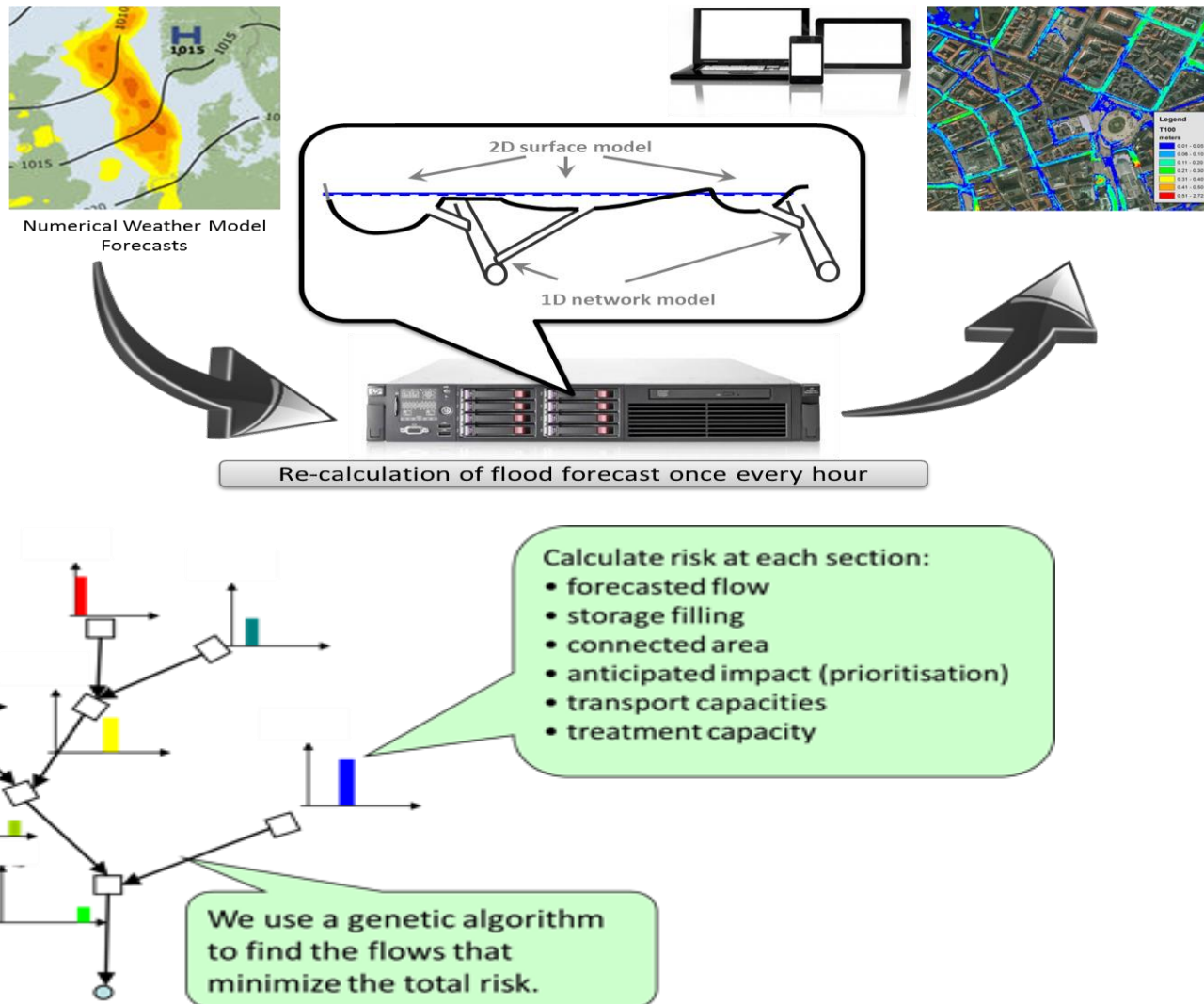
❖ Real Time Control Methodology:

- ❖ *radar based flow forecast – with auto-calibrating real time models*
- ❖ *dynamic risk assessment algorithm to optimize storage and treatment (considering forecasted flow, recipient sensitivity, current storage, treatment capacity ...)*
- ❖ *As a result, 90 % elimination of the overflow situations per year was demonstrated in 2013/2014.*

Copenhagen: STAR Utility Solutions **PREACT**

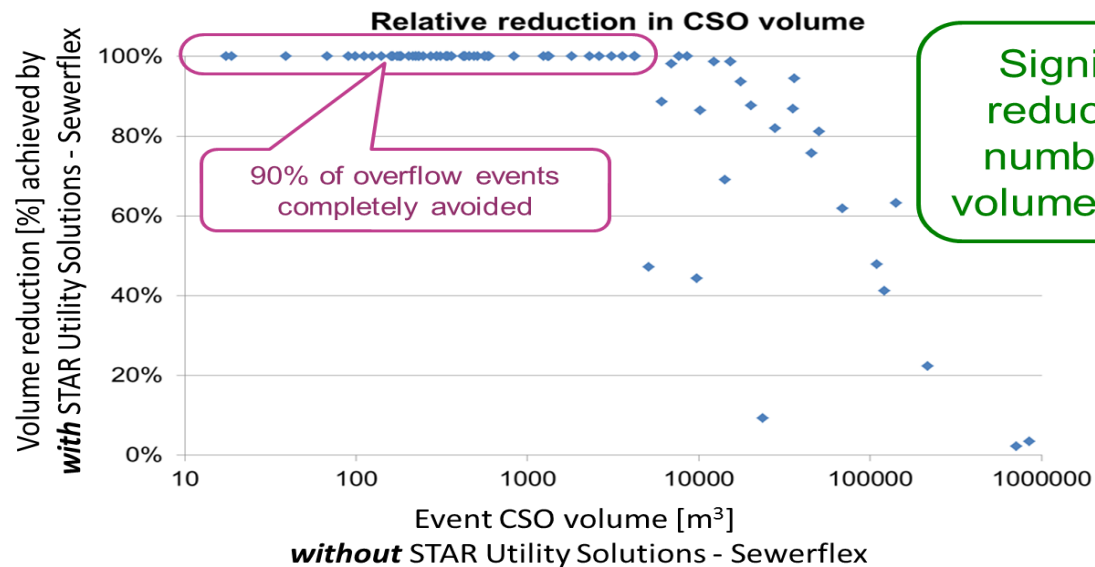
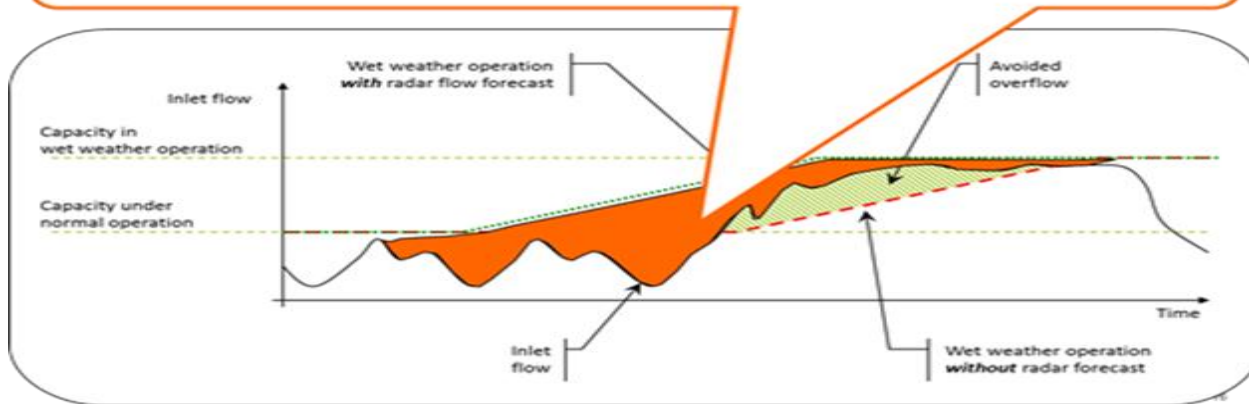


Copenhagen: STAR Utility Solutions

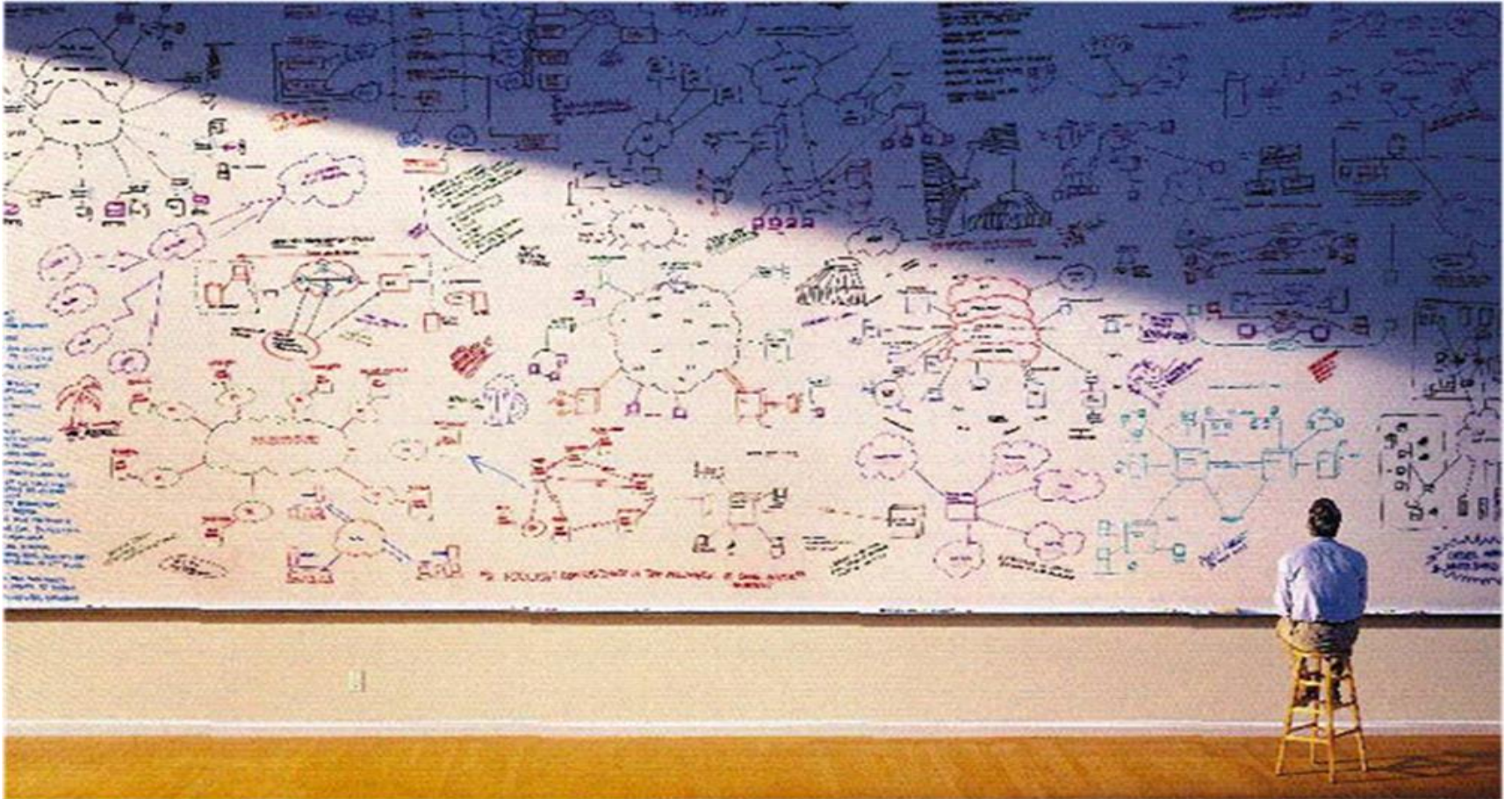


Copenhagen: STAR Utility Solutions

Avoid combined sewer overflow
(flow forecast + wet weather operation) + integrated real time control



As a conclusion : resilience will be smart



Thank you