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and Research

Water research for the future – towards a sustainable nexus approach

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Conference on Sustainability in the Water-Energy-Food Nexus, 19-20 May, Bonn, Germany

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Challenges for Water Research

Growing Demands

- Population Growth and Structural Change
- Food Production
- Industrial Production
- Energy production

Research, Development and Innovation Provide Solutions for a Sustainable Water Management

Decreasing Availability

- Pollution
- Climate Change
- Distribution Problems
- Water Losses

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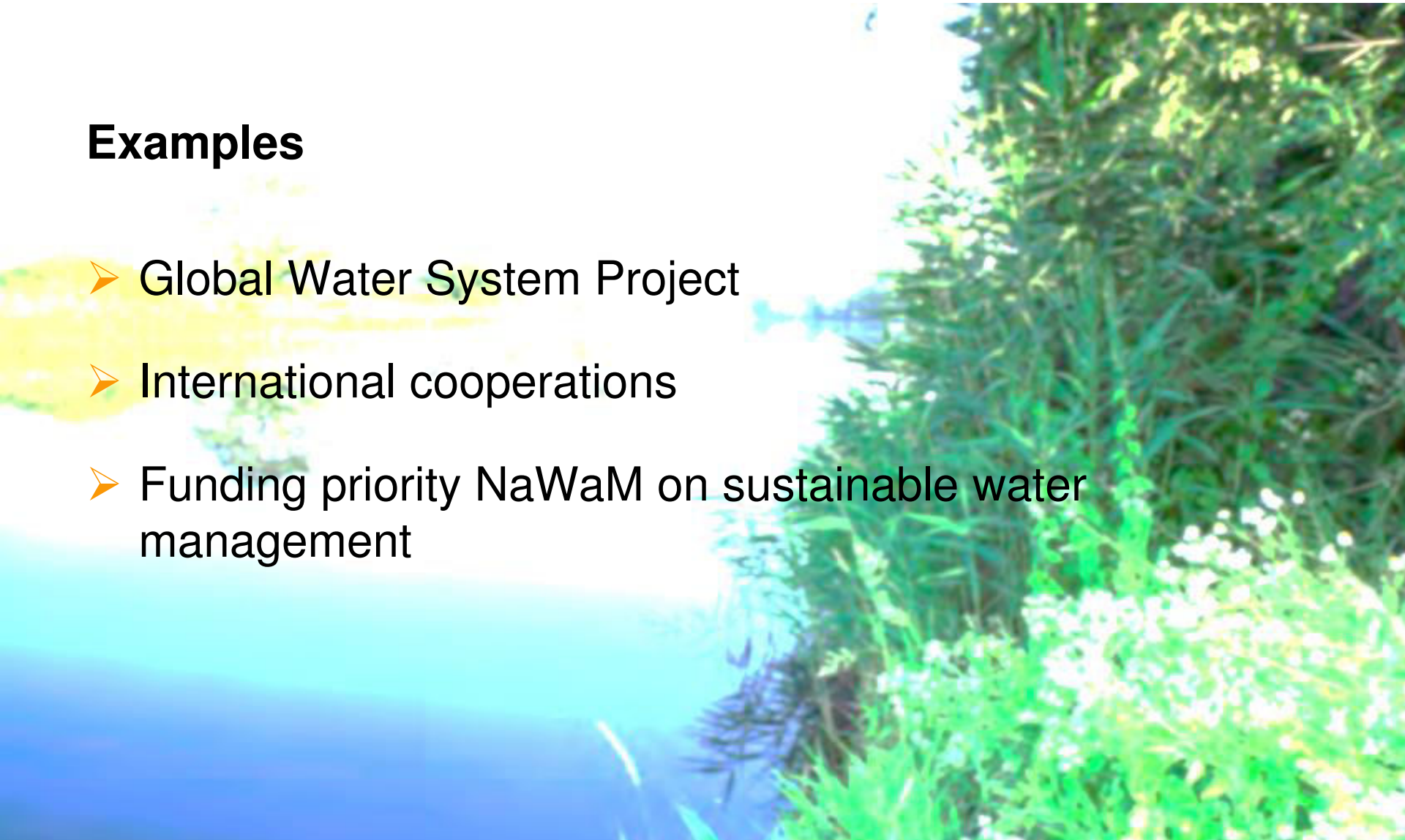
BMBF Approach

Examples

- Global Water System Project
- International cooperations
- Funding priority NaWaM on sustainable water management



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GWSP`s Contribution to Nexus Thinking

2002 – 2004: Establishment of the **Global Water System Project** (GWSP) as a "Joint Project" of the four Global Environmental Change Programs DIVERSITAS, IGBP, IHDP and WCRP

2003-2014 Funding Budget: 3,15 Mio. €

2011	GWSP launched an **expert survey** that addressed the nexus between water, energy and food in 18 major river basins across the globe
2012	Results presented and discussed with partners at the **International Conference** on "Water-Energy-Food-Security: New directions for water management"
2013	**GWSP Special Issue** in Current Opinion in Environmental Sustainability summarizing findings on the water, energy, (land and) food nexus
2014	- **Joint Workshop** with European Space Agency (ESA) and the Food and Agriculture Organization (FAO) on Earth Observations and the Water-Energy-Food Nexus - **Conference on** "Sustainability in the Water-Energy-Food Nexus"

Sino-German Research & Innovation Programme

CLEAN WATER

- Science for People -

Joint Steering Committee (MOST, BMBF etc.) and **working groups**

Joint Programme Coordinating Office (PR, Transfers, Marketing)

Water Supply	Waste Water Treatment	Water Resources Protection	Clean Industry Production
• treatment process • distribution • water losses • management	• semi-centralized facilities • nutrient recycling • energy saving • water reuse	• rivers • lakes • groundwater • coastal areas	• reduction of water use • cleaner processes • monitoring and control • management

Capacity Building & Good Governance

CLIENT-Clean Water-Projects (1st – 3rd call)

National R&D Programmes

National Guidelines and Regulations

German / Chinese Administration, Science and Industry

Intergovernmental Agreements (MOST / BMBF etc.) **Governmental Partners**

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"SEMIZENTRAL" – A new concept for rapidly growing urban areas

- **Integrated approach**
  - Water reuse, bio-waste, energy, nutrients
- **High flexibility**
  - Modular technology
- **Up to 40% water savings**
  - Grey water recycling for toilet flushing
- **Energetically self-sufficient**
  - Combined treatment produces enough energy for operation
- **Nutrient recycling**
  - Phosphorus and ammonia recycling from bio-solids
- **Disinfected sewage sludge**
  - Agricultural application

TECHNISCHE UNIVERSITÄT DARMSTADT

Artist's view of "SEMIZENTRAL"
size: 65m x 76m
Launched in Qingdao,
World Horticultural Exposition 2014

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NaWaM
Sustainable Water Management

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Sustainable Water Management (NaWaM)

- „Risk Management of Emerging Compounds and Pathogens in the Water Cycle" (RiSKWa, IV/2011)

- „Smart and Multifunctional Infrastructural Systems for Sustainable Water Supply and Disposal" (INIS, II/2013)

- "Future Oriented Technologies and Concepts for an Energy-efficient and Resource-saving Water Management" (ERWAS, II/2014)

- „Regional Water Resources Management for Sustainable Water Protection" (ReWaM, I/2015)

- „Increase of water availability by water reuse" (REUSE)

NaWaM
Sustainable Water Management

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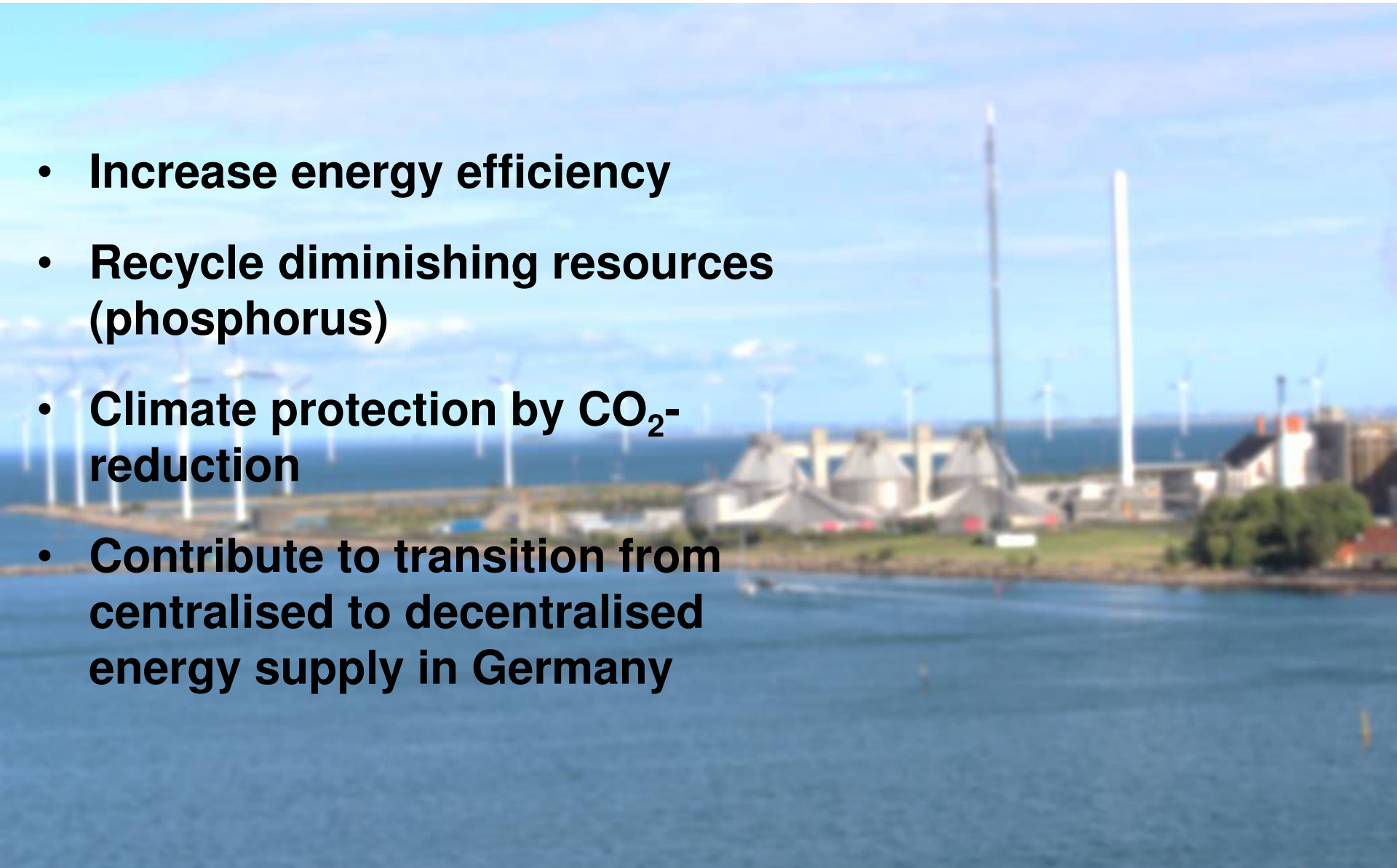
Goals

NaWaM Sustainable Water Management

ERWAS Future-oriented technologies and concepts for an energy-efficient and resource-saving water management



- Increase energy efficiency
- Recycle diminishing resources (phosphorus)
- Climate protection by CO_2-reduction
- Contribute to transition from centralised to decentralised energy supply in Germany

ERWAS will promote research, development and innovation on the link between water, energy and resources

→ in water supply

→ in waste water treatment

- Innovative, **energy-efficient technologies and processes**
- **Potentials for energy generation**
- Improved concepts for **control and operational management**
- Integration into a regional **management of energy- and material flow**

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Projects

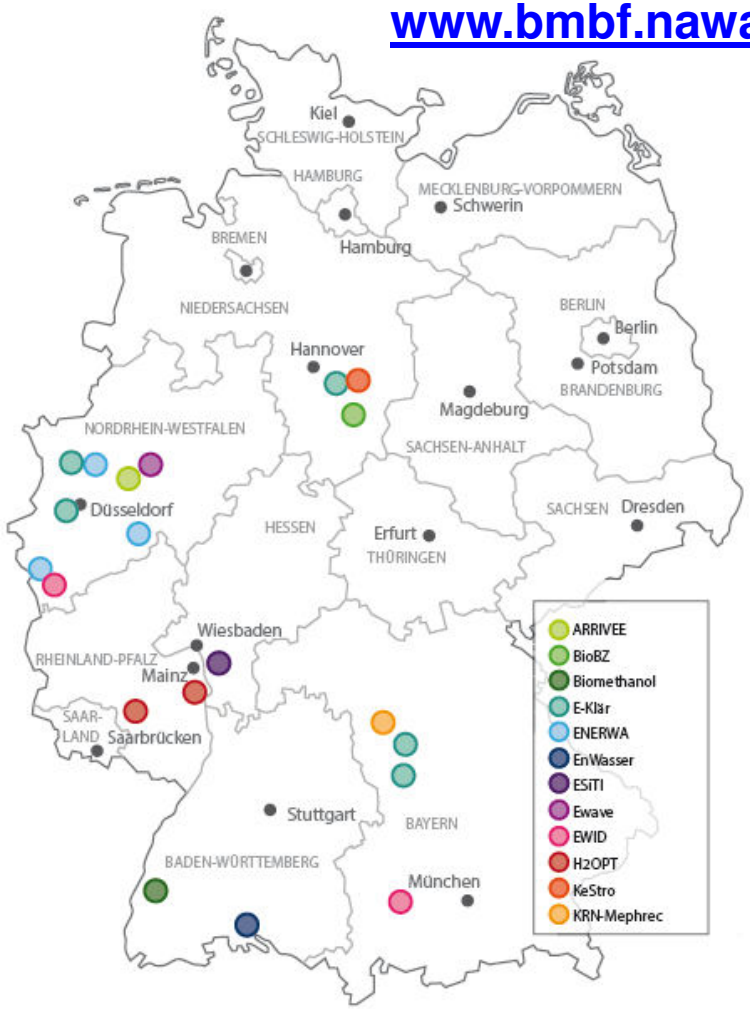
NaWaM Sustainable Water Management

ERWAS Future-oriented technologies and concepts for an energy-efficient and resource-saving water management

www.bmbf.nawam-erwas.de

Funding measure ERWAS:

- Duration: 3 years, start April…May, 2014
- 12 collaborative research projects, one networking and transfer project
- 67 partners
- 20 research sites
- 27 Mio. € funding volume



Thank you very much for your attention!

NaWaM Sustainable Water Management