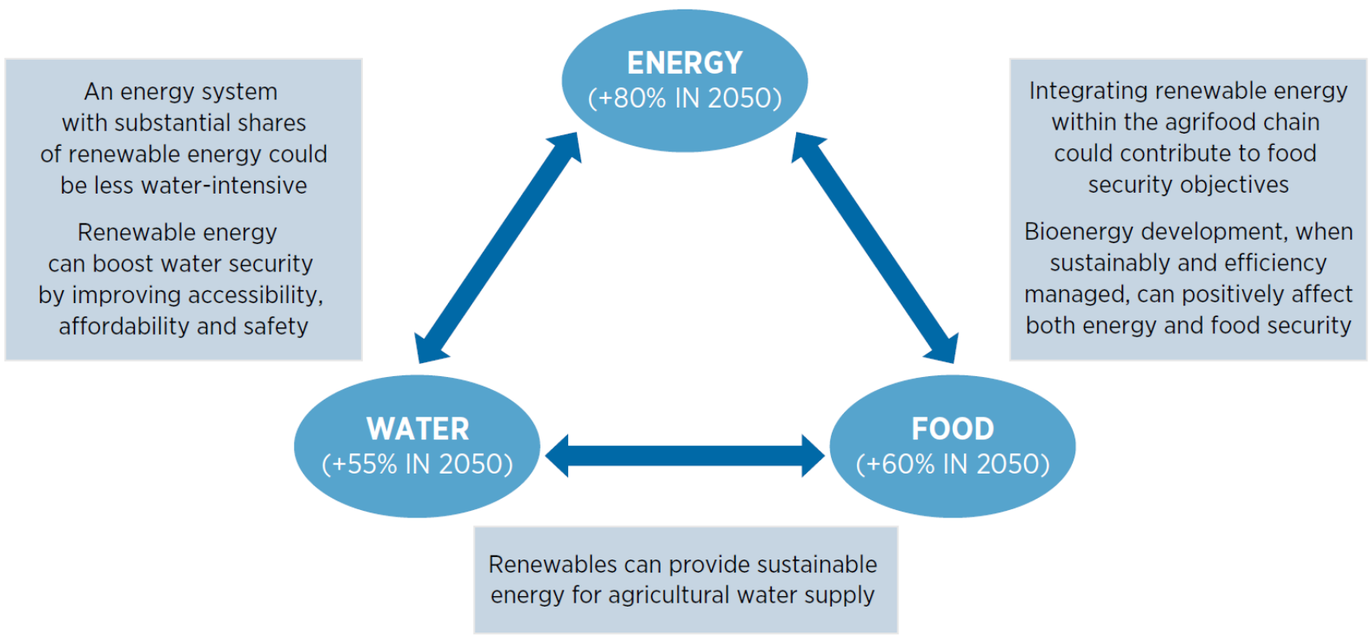
The Role of the Water-Energy-Food Nexus in Industrial Applications

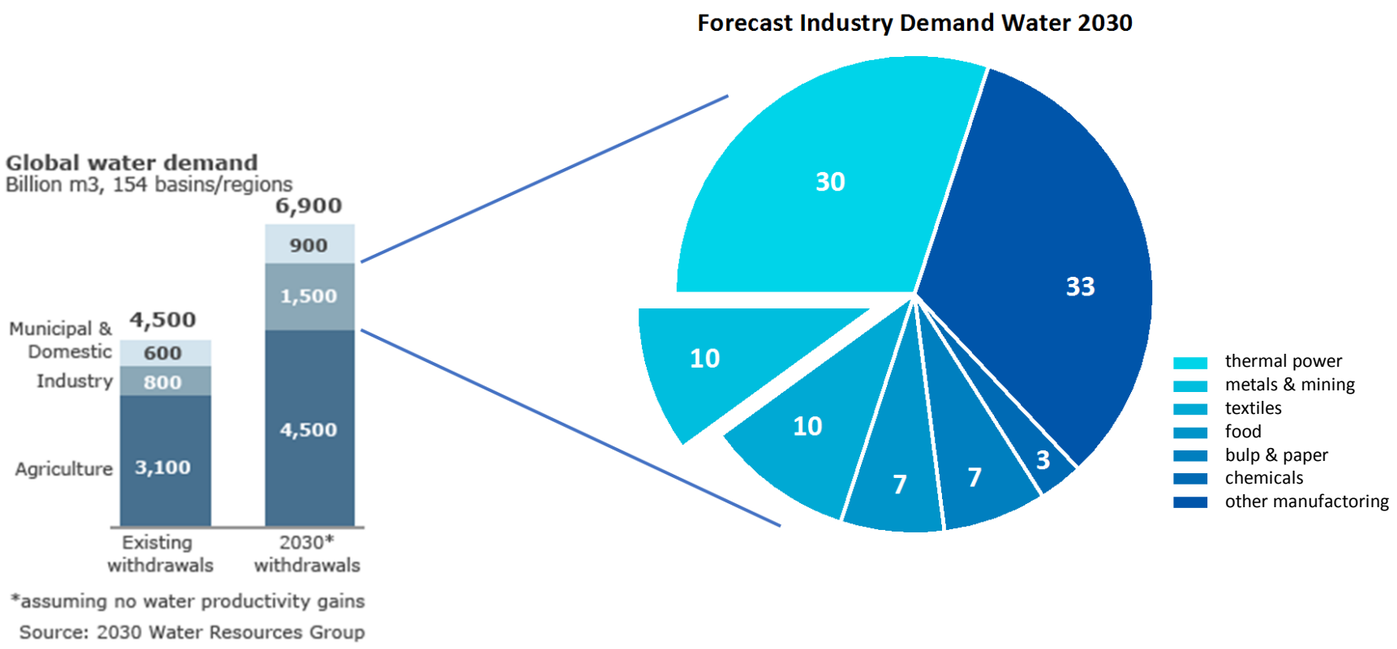
Prof. Dr. Petra Schneider[1], M.Sc. Lukas Folkens[1], B.Eng. Tino Fauk[1], M.Sc. Kay Plat[1,2]
[1]Magdeburg-Stendal University of Applied Sciences, Germany
[2]Leipzig University, Project "Greenhub"

Forecast for the Development of Global Problems



Source: IRENA's Renewable Energy in the Water – Energy – Food Nexus

Future Demand of Water in Industries



Source: 2030 Water Resources Group, CLSA 2014

Nexus Approach in Industrial Applications ?

interrelatedness and interdependencies of environmental resources

- mitigating fragmentation of material and energy cycles
- closing the loops of environmental resources

their transitions and fluxes across spatial scales and between compartments

- collaboration between sectors for responsible joint use of resources
- benefiting from cascade effects to reduce / eliminate waste

Nexus Approach in industrial applications can be considered a form of sharing economy

Implementation of the Nexus Approach in Industrial Applications: Industrial Symbiosis

Sharing resources to increase resource productivity

- foster circularity
- increase products and resources life time across the value chain
- propose Nexus dialogue as communication approach between sectors

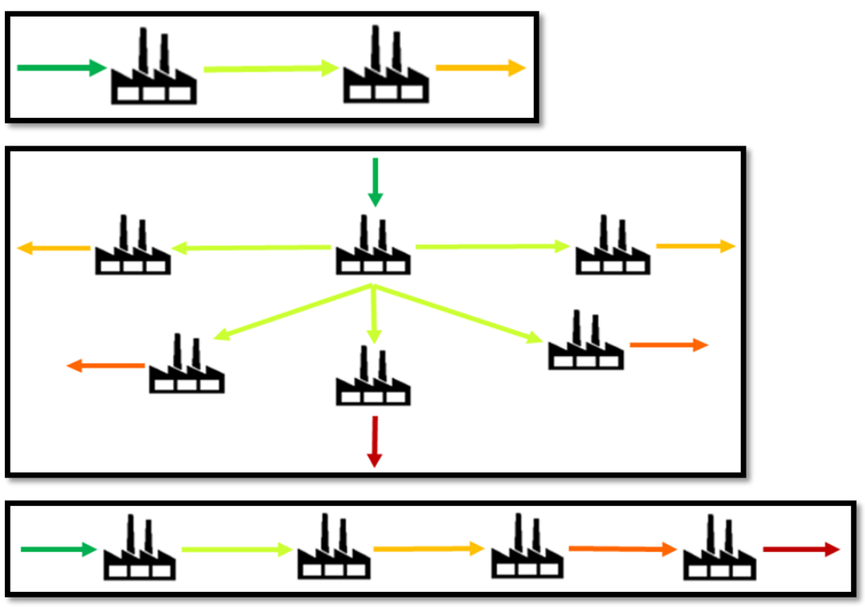
Samples for Water-Soil-Waste Nexus as industrial symbiosis: Industrial Symbiosis in Kalundborg, Denmark

Samples for Water-Energy-Food Nexus implementation approach as industrial symbiosis: Industrial Symbiosis design in Zayandeh Rud River catchment, Iran

Industrail Symbiosis & Sharing Economy

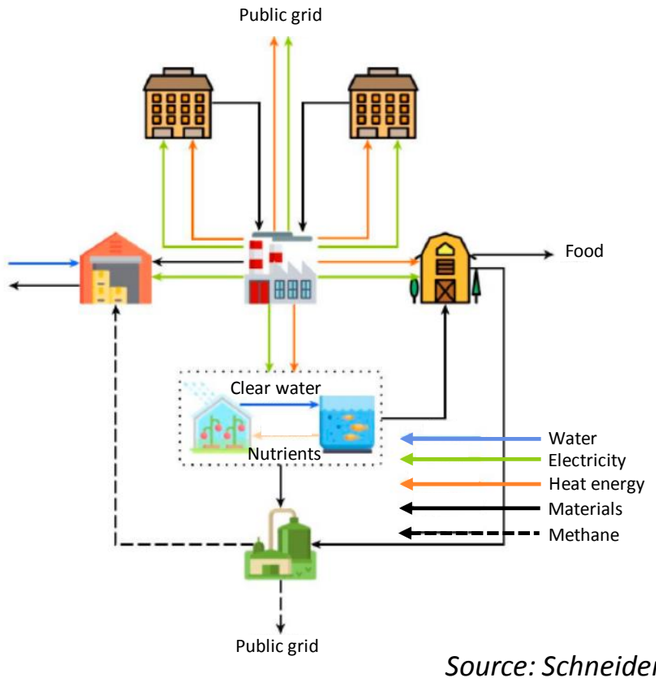
Sharing through Appropriate Linking

1. Bilateral principle
2. Nucleus principle
3. Cascade principle



Source: von Koerber, University of Applied Sciences Magdeburg-Stendal, 2016

Industrial Symbiosis design for Urban Applications



Source: Schneider et al. (2019)

ANSPRECHPARTNERIN

Prof. Dr. Petra Schneider
Wasser, Umwelt, Bau & Sicherheit
Fon: +49 (0) 391 – 886 4577
petra.schneider@hs-magdeburg.de

Hochschule Magdeburg-Stendal
Breitscheidstraße 2
39114 Magdeburg