Integrated Resource Management

(Water / Energy / Food Security / Land Use) in Asian Cities:

THE URBAN nexus

1st Phase 2013-2015
2nd Phase 2016-2019

Financed by:
BMZ
(German Federal Ministry for Economic Cooperation & Development)

Implemented by:
GIZ
German International Cooperation

Political Partner:
UN ESCAP
United Nations Economic & Social Commission Asia Pacific

Implementation Partner:
Local Governments for Sustainability
(ICLEI South Asia & South East Asia)

THE URBAN nexus Results

- More than **30 practically oriented nexus infrastructure (pilot) projects** elaborated in the Nexus partner cities amounting to an **investment volume of USD 300 million CAPEX** (pre- and feasibility studies also including OPEX).
- Decision makers have been made aware that **waste and waste water are not a burden but an opportunity to create additional income.**
- The introduced technologies reflect decentralized approaches, however, being built up as **modular systems**, they can also **be integrated into existing grid systems**.
- Cross-sectorial composed **Nexus Task Forces** in Nexus Partner Cities accompany pro-actively the elaboration of the infrastructure projects.
- In national-subnational-local dialogue forums questions of mandates, technology solutions and decentralization approaches are discussed and have led to improved mutual understanding in the framework of **vertical integration.**
- **Horizontal integration** promoting inter-communal cooperation in particular with regards to infrastructure projects requiring economies of scale are increasingly emerging in the area of solid waste management.
- **Peer-to-peer learning** has led to a better mutual understanding of shared problems and solutions, however, always requiring a tailor-made approach.

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Korat, Thailand
Efficiency in water supply

Fine-tuning of water supply pumps

Monthly municipal expenditures were reduced by U$ 25.000 for electricity by fine tuning the water supply pumps in Makhamtao Pumping Station in Korat recommended in the framework of a practical study conducted by the Urban Nexus Project in cooperation with KSB. The investment costs for the Municipality amounted to U$ 2.500.

Unaccounted water

A study indicated that the Municipality loses more than U$ 4 million per annum for unaccounted 53% water supply.
As consequence the Municipality decided to replace obsolete water meters of more than 25 years of age.
A resolution was issued changing responsibilities and implementing new procedures.

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Da Nang, Vietnam

Vacuum Sewer Collection, Solid Waste to Energy

Innovative wastewater management

Innovative wastewater management
in the Eastern Coastal area of Da Nang (pilot project).

Benefit:
Usage of black water for energy production, grey water for agriculture, sludge as nutrient for (urban) agriculture
CAPEX: U$ 500.000 for 110 households and market place
OPEX: U$ 7000/a
Within World Bank loan for sanitation, tendering process in preparation
Upscaling in progress

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Naga City, Philippines
Climate Change Resilient Buildings

Climate Change Resilient Pilot House (CCRPH)

Conventional housing:
average m2 price: U$ 333/m2

CCRPH house:
average m2 price: U$ 110-210/m2

The CCRPH is cost-efficient and environmentally friendly based on a modular architectural design system reducing the formwork and the amount of concrete.
Saving of 30% of waste material through improved construction site management.
The CCRPH was awarded with the green building certificate for second greenest building in the PH and is recognized by the AITECH/NHA.

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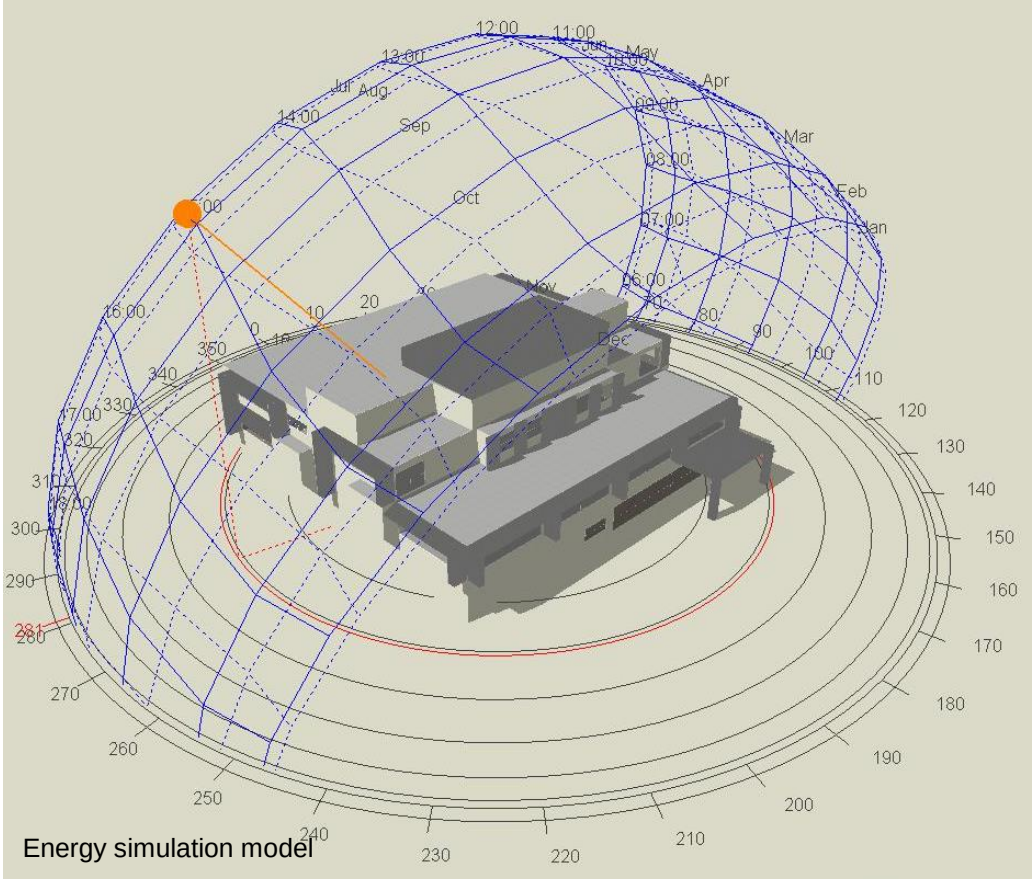
Chiang Mai, Thailand

Energy Efficiency of Buildings

HEALTH CARE CENTER for elderly people

Energy Efficiency Study
Chiang Mai, January 19, 2017

	Area [m²]
Gross Floor Area	2,670
Air Conditioned Building Area	1,631
Unconditioned Building Area	1,039



Energy simulation model

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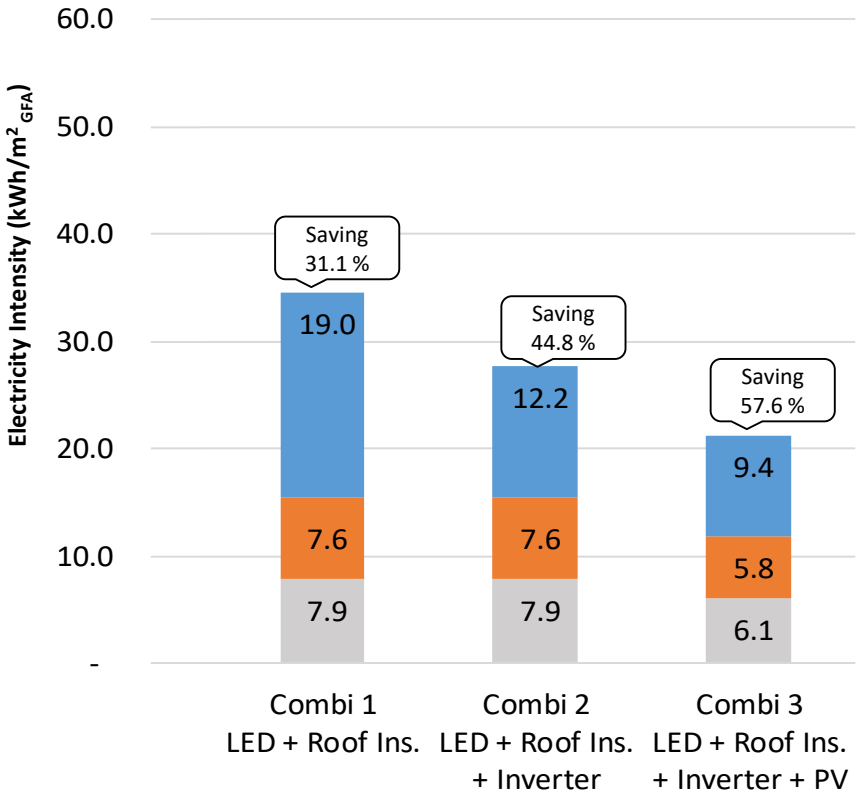
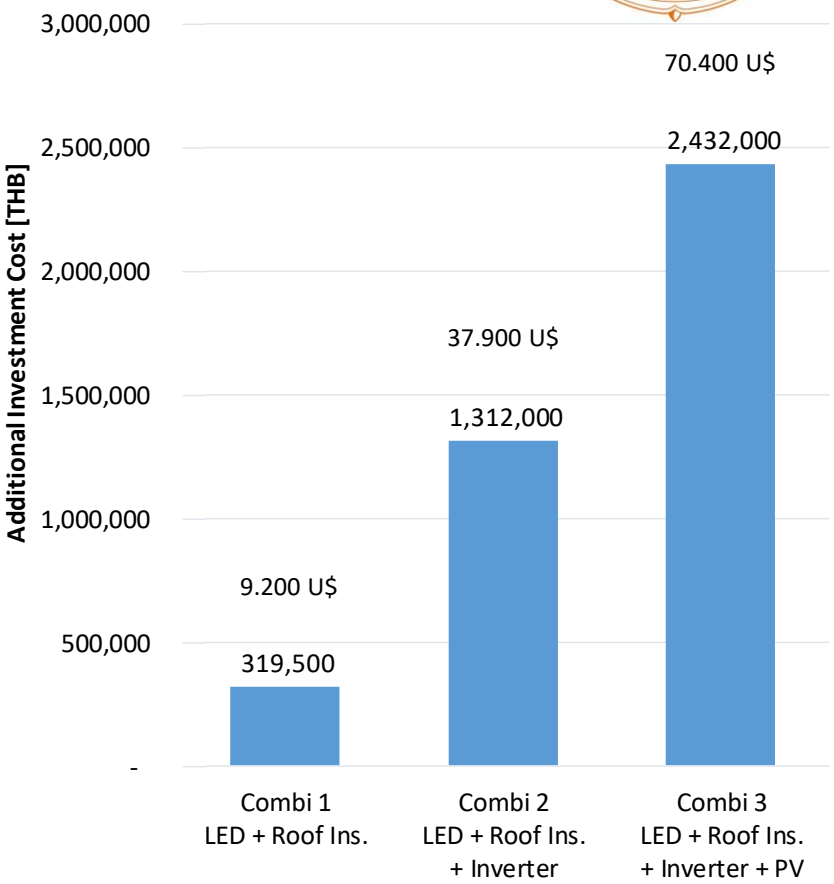
Chiang Mai, Thailand

Energy Efficiency of Buildings

HEALTH CARE CENTER





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Ulaanbaatar, Mongolia

Energy Efficient in existing Buildings

Thermo-technical rehabilitation of school buildings, (financed by USAID, implemented by GIZ, Grant Agreement)

Thermo-technical retrofitting of buildings reduces heat energy consumption and CO2 emissions by 50%.

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Ulaanbaatar, Mongolia

Energy Efficient New Construction

Mongolian German ECO City in Ulaanbaatar; Heat energy consumption of 120 kWh/m2/a in comparison to conventional heat energy consumption of 350 kWh/m2/a.

Elaboration of **energy master plan** study for Ulaanbaatar outlining a systematic transformation of the energy sector by 2050.

Wastewater treatment plant - peer to peer learning with Nagpur
A new waste water treatment plant able to recycle treated waste water for nearby cooling towers of coal fired power plants is envisaged for Ulaanbaatar.

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Nagpur, India,

Wastewater management, Solid Waste Management

Advanced Smart City Concept

Waste water treatment plant (100.000m3/d) treating waste water up to tertiary level for cooling of towers of coal fired power plant 17 km away;
Coal fired treatment plant has secure water supply and does not compete with demand for drinking water from lakes and dams.
Complete private investment of U$ 40 million, on PPP basis.

Peer-to-peer learning

Trip of the Mongolian delegation to Nagpur City to study sustainable water and waste water management to be introduced in Ulaanbaatar (use of ww for cooling of coal fired power plant)

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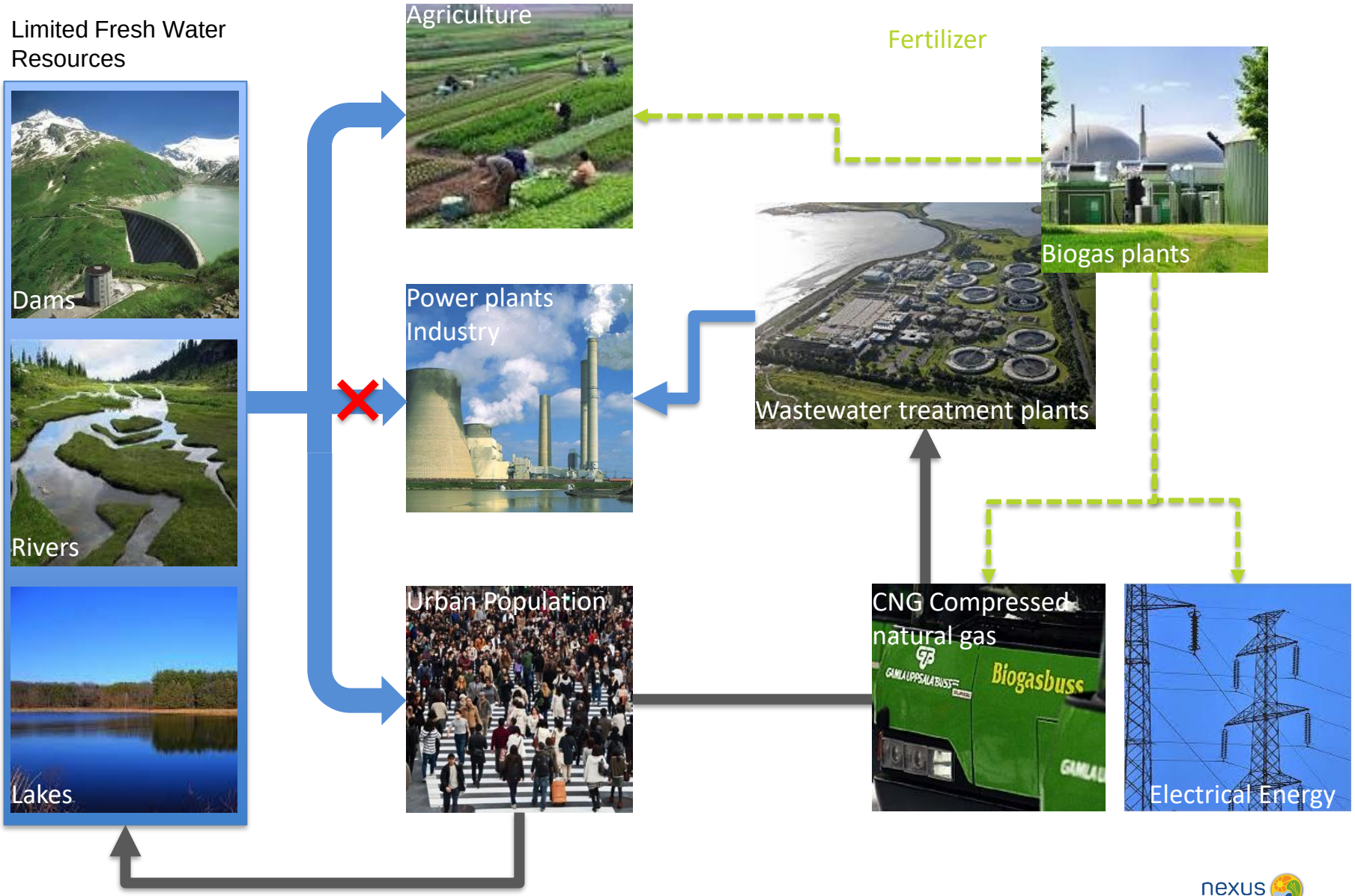
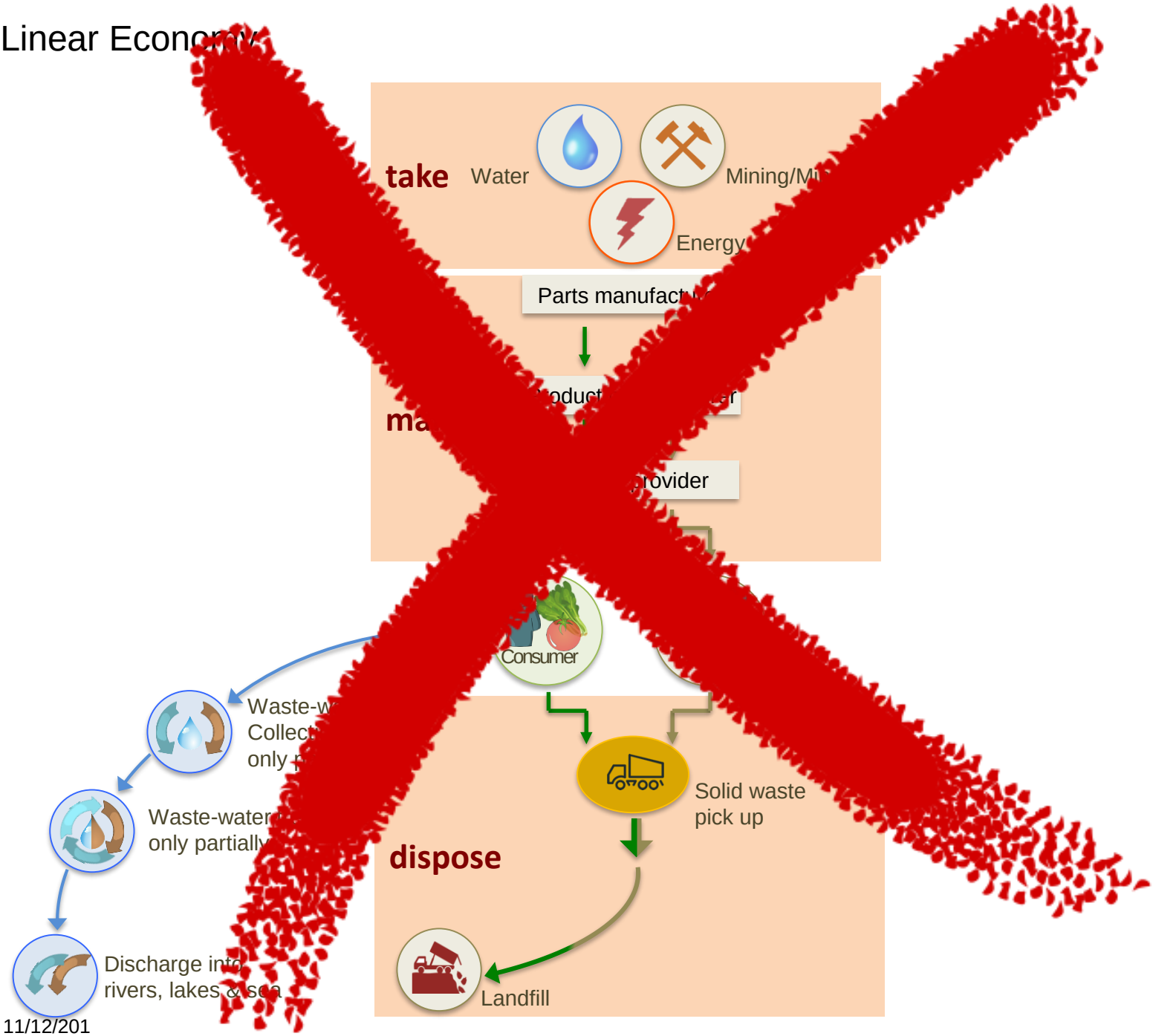
Wastewater use & reuse



Linear Economy



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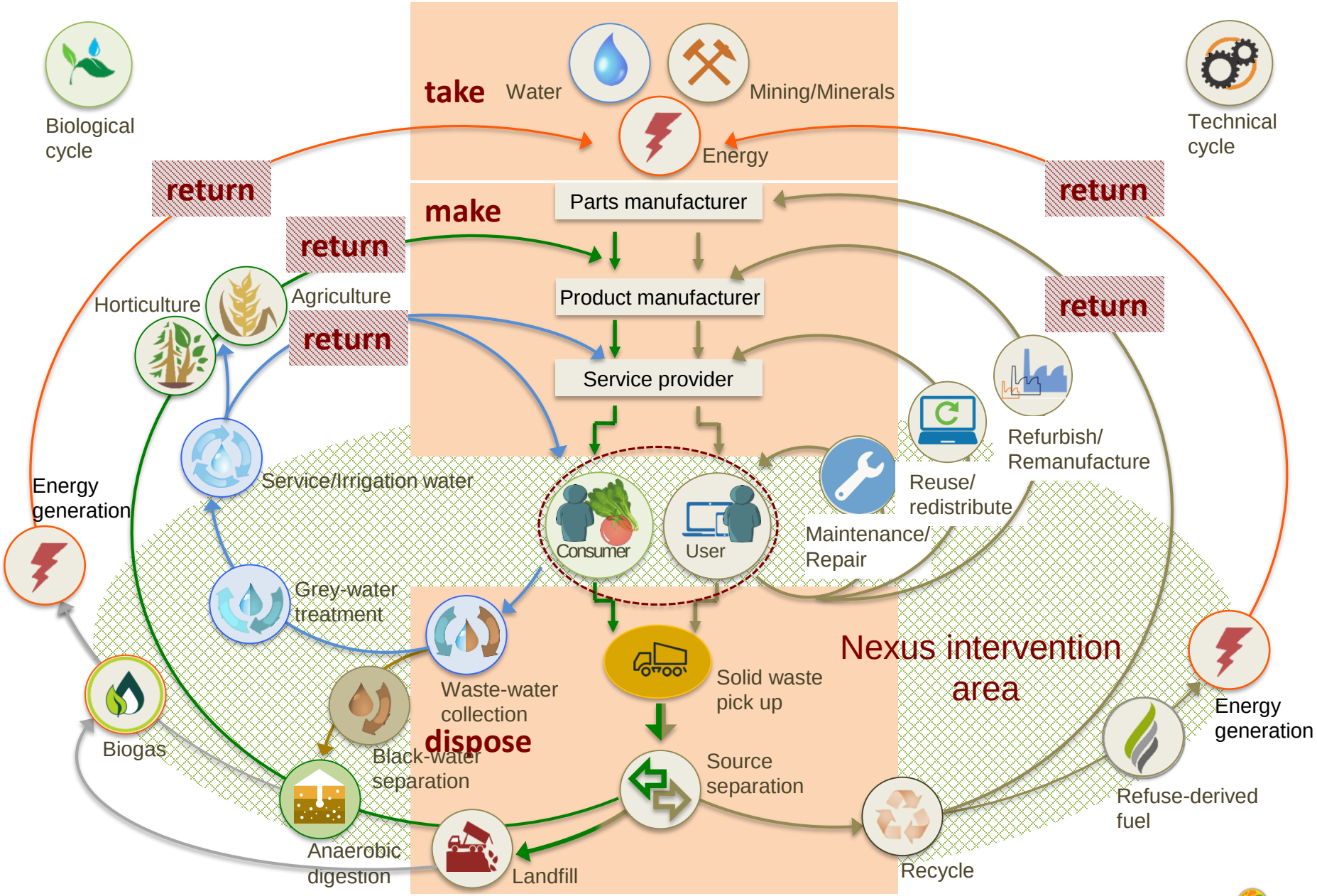
Circular Economy with Energy & Mass Flow Cycles



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New Formats

VERICAL INTEGRATION

National –sub-national-local dialogues based on case studies (country wise) promoting communal autonomy

HORIZONTAL INTEGRATION

Inter-communal cooperation to solve infrastructure problems (cooperation beyond administrative boundaries) reaching economies of scale;
Organizational structures for clustering required
Inclusion of academia

Peer-to-peer learning, south-south dialogue

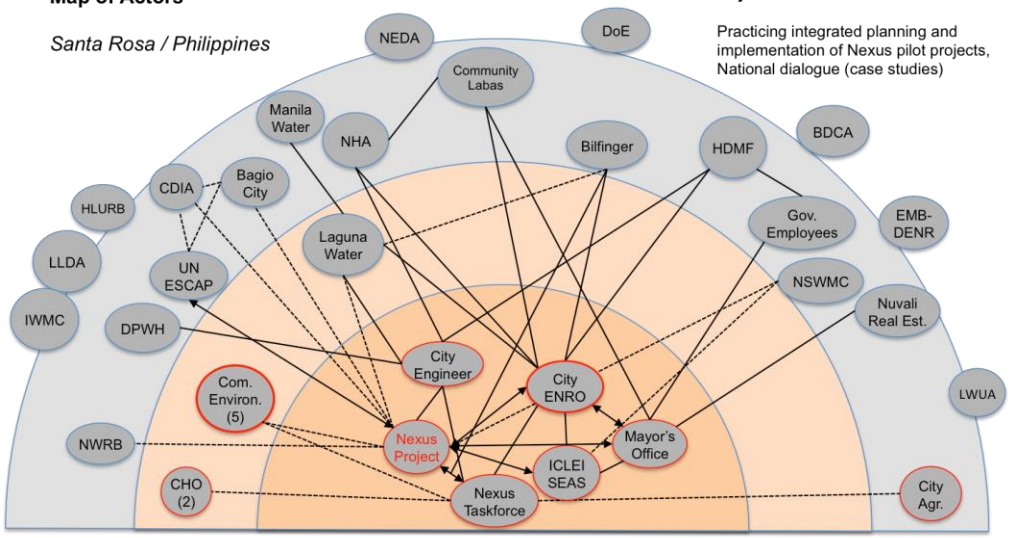
Experience sharing through mutual visits
Institutionalized Nexus Working group meetings once to twice a year
UN ESCAP and ICLEI SA & SEA Websites with studies

Map of Actors

Santa Rosa / Philippines

Objective:

Practicing integrated planning and implementation of Nexus pilot projects, National dialogue (case studies)



DOE	Department of Energy
LLDA	Laguna Lake Development Authority
IWMC	Integrated Watershed Management Council
BCDA	Based Conversion and Development Authority
LWUA	Local Water Utilities Administration
NWRB	National Water Resources Board
HUDCC Council	Housing and Urban Development Coordination
NHA	National Housing Authority
HLURB	Housing and Land Use Regulatory Board
HDMF	Home Development Mutual Fund
NEDA	National Economic Development Authority
DPWH	Department of Public Works and Highways
EMB-DENR	Environmental Management Bureau – Department of Environment and Natural Resources
NSWMC	National Solid Waste Management Commission

Nexus Training Manual (A Training Toolkit for integrated resource management in Asian cities)