



## Circular Economy in Taiwan

### Why Taiwan

The Netherlands is at the forefront of the transition to a Circular Economy (CE). Since the new government in Taiwan (May 2016) made CE part of its national economic policy, Taiwan is keen to learn from the Netherlands how circular economy has been developed in terms of policy making and implementation, and to learn how the Netherlands copes with the challenges ranging from the periodic water and energy shortages, the dependency on fossil fuels, regeneration of industrial parks and urban planning, to food surplus, and the high ratio of waste landfill and incineration. Netherlands Trade and Investment Office (NTIO) has already assisted several government ministries and agencies (EPA, MOEA, etc.) to learn from the Netherlands in CE policy making and implementation. NTIO collaborates closely with the Taiwan Circular Economy Network (TCEN) (MOU in 2015), and co-organized a large delegation of 25 Taiwan government officials and company CEO's to join the Netherlands Circular Hotspot Conference in April 2016. NTIO- and TCEN- invited media for CE tours and organize national CEO conferences have brought CE to the attention of all stakeholders in Taiwan (industry, academia, government, NGO's). NTIO facilitated in a number of visits by Taiwan ministers (Ministry of Science and technology, EPA) and city mayors to the Netherlands to learn more about CE policy making, CE implementation by regions and company visits.

CE was also one of the major themes in the Taiwan-Netherlands City Innovation Roadshow and Forum (October 2016), NTIO's successful project that introduced 10 city innovation solutions to the city government of Taiwan's seven major cities. Result of these activities is that the Netherlands is now seen as the world's leading country in CE policy making and implementation.

### Government plans

In order to develop green innovative materials (new materials), Taiwan government is promoting the "Application Scheme for establishing the **Nationwide Circular Zone Pilot Project** and **New Material Circular Industrial Park Project**". Aiming at enhancing the waste-to-resources rate to 2%, and reducing the waste landfill and incineration rate to 3% by 2020, the government will develop a number of pilot projects to fulfill the plan; e.g. a regional energy supply center and a waste-to-resources circular center, and the government will complete the planning and design works for a regional water recycling center. As to the establishment of the New Material Circular Industrial Park, Kaohsiung City Government is commissioned for the land acquisition at Dalin Pu village where it is planned to set up a circular industrial park. The early stage investigation and assessment report will be completed by end of 2017. The complete plan (including budget plan) for the construction of this New Material Circular Industrial Park should be finished by 2021. Furthermore, Taiwan government will facilitate at least 2 projects annually in the development of green innovative materials.

Furthermore, Taiwan has just announced a "Forward-looking Infrastructure Construction Program" that requests NTD880 billion (€27.12 billion) government funding to embark on the infrastructure needs for the next 30 years, in order to upgrade the efficiency of inter-regional resources circulation and to build up a smart and resilient Taiwan in responding to climate change.



## Potential projects in Taiwan

### 1. *Circular economy scan for cities and regions:*

- Taoyuan city is where Taiwan's main international airport is situated, and it is developing an aerotropolis (airport city) next to the airport. Circular economy is the main concept behind the development plan. The CE development at Amsterdam Schiphol Airport and its surrounding area developed by SADC has been taken as the main reference for the future development of Taoyuan aerotropolis.
- Kaohsiung city is a harbor city where most of Taiwan's oil refineries, shipbuilding yards, and heavy industries are located. The city government has the ambition to transform Kaohsiung into an ecological, low-carbon emission, sustainable, and livable city by planning many projects in developing green mobility, wetland eco-corridor, green buildings, and the use of solar power generation.

### 2. *Industry parks adopt the CE implementation:*

- New Material Circular Industrial Park (High-Value Petrochemical Industry Park): Kaohsiung (at Dalin Pu Village) is designated by the central government to set up the first circular industrial park.

### 3. *Water purification / recycling:*

- Government's "Forward-looking Infrastructure Construction Program" is a request to allocate NTD 3.5 billion (€108 million) for building up at least 6 reclaimed water projects nationwide. The reclaimed water will be supplying for the use of industrial parks and science parks.
- The nationwide water environmental demonstration plan tends to build up 43 demonstration sites in Taiwan by installing water permeable pavement, green roof, ecological water detention facilities, planting ditch, infiltration side ditch/well to low down the impact on urban development.

### 4. *Agriculture applications:*

- State-run company TaiSugar has 19 pig farmers that are large in scale and are planning to carry out biogas power generation by converting the pig manure into energy. American engineering consultancy (MWH Taiwan Branch) is hired for planning and design the biogas center for TaiSugar. Technology/system providers from Denmark and Germany are keen to team up with MWH to enter the market.
- Pingtung County poultry manure biogas center also will be planned and designed by MWH which is hired by the Environmental Protection Bureau of Pingtung County Government.

Chances for Dutch companies to enter this market will be team up with MWH and/or engineering consultancy companies in Taiwan.

### 5. *CE-based smart green community:*

- Together with Tainan City Government, central government is building up a Green Energy Science Park (City) at Shalun in Tainan covers an area of 22.3 hectares, and will allocate NTD 31.9 billion (€982 million) to this project. This future park will spur R&D and



serve as a demonstration site for green energy technology; e.g. energy creation (solar and wind power), energy storage (fuel cells), energy conservation (green architecture) and systems integration (smart grids). To achieve that, this science park will apply the low carbon / smart environmental approach to layout its infrastructure. Two verification platforms will be built to serve the green energy industry and the technology development for regional energy storage. Creates a 3<sup>rd</sup> party testing and verification center for the investment on the renewable energy, as well as a residential zone for the science park.

Many projects listed above might not be qualified for proceeding the international tenders, it is recommended for Dutch companies/organizations that are trying to enter the market in Taiwan to first partnering with prominent local players as a start. NTIO is able to facilitate the business matchmaking process.

6. *Training program on CE:*

The Netherlands is recognized as one of the foremost frontrunners in CE in Taiwan. Taiwan is enthusiastic to learn from the Netherlands how CE has been developed in terms of policy making and implementation, as well as the best practices. A well-developed training program on CE (maybe issue a certificate for completing courses in a specific sector) will definitely be appreciated in Taiwan. Potential local partners could be universities, research institutes, and CE organizations (e.g. TCEN) in Taiwan.

**Highlighted visiting program to Taiwan:**

1. Workshop with ministerial government officials:
  - Some of the Dutch consultants could deliver the detailed presentations on some of the value chains (biomass, construction, manufacturing, etc.).
2. Workshop with city government officials:
  - Exchange views between city governments from the Netherlands and Taiwan on the development of a CE city scan and implementation.
3. Seminar on the CE development in the Netherlands
4. Site visits to CE parks and companies
5. Business matchmaking
6. Networking event