## **BELGIUM**



Fig. 7 Result analysis of Belgium

# **Country Result & Analysis**

Belgium scores average (50/100) in all four criteria of ASEI. The country's high general innovation capacity level and economic competitiveness pull up the country's overall "eco-innovation capacity" score to be slightly above average. In regards to "eco-innovation activities", the country scores below average in the "level of environmental management of companies", "turnover of environmentally friendly companies", "renewable energy utilization level", and "green technology SMEs at Early Stage". However, "number of green patents" and "level of commercialized green technology" are relatively high compared to the average of ASEM member countries. Belgium has few natural resources and a small share of renewable energy thus, the government has put direct attention to activate and develop green technology start ups in the recent years as a way to overcome such challenge. As with "eco-innovation supporting environment", the country scores relatively high in the level of systematic environmental laws applied at national level and the "level of country's commitment to international environmental agreed goals" compared to the other indicators score in the criteria. In terms of "eco-innovation performance", the country shows a moderate criteria score. The moderate "eco-innovation performance" is described by the country's low energy sustainability, low score on water consumption intensity and small size of green industry market. Yet, the country scores higher than average in the "level of environmental impact on society" and "CO2 emissions intensity". Overall, Belgium ranks slightly below average on the ASEI index.

# **Belgium's Key Eco-Innovation Environment**

In the recent ETAP conference held in 2011, the Belgium government showed its recognition on the broader understanding of eco-innovation; that eco-innovation is not merely signifying new technologies but new management skills, new governance paradigms and business models to reduce overconsumption of natural resources and to protect the environment. Belgium's three Regions have slightly different approaches towards promotion of eco-innovation. Blend of Belgium's different regional policies and programmes may bring a synergetic effect at the national level in the future.

### **Regional Clusters Activating Eco-innovation**

Belgium contributes to developing innovation solutions through clustered environment. In Wallonia region, Greenwin<sup>26</sup> was set up in 2011 focusing on green technologies and in effect creating green jobs in the region. Greenwin was an outcome of announcement of the Walloon Marshall Plan 2(2009-2014)<sup>27</sup>, which is a national roadmap to addresses the challenges of climate change and greening of the economy. In Flanders region, Energyville, Ghent Bio-Energy Valley and Greenbridge Science Park are dedicated to biotechnology and energy efficiency solution development. Different regional clusters have taken their own initiatives to develop the eco-industries related to renewable energies, and green technologies. While currently, green clusters like Greenwin are seen as a driver of eco-innovation, there are potential for other regional clusters focusing on different sectors to integrate eco-innovation solutions into their business, production and supply processes which will uptake further eco-innovation activities in Belgium.

### Frontrunner of Eco-innovative Recycling Waste Management

Belgium is known to recycle 93 percent of its household packaging and 78.4 percent of industrial packaging waste.<sup>28</sup> This figure is highest in Europe. Various governmental measures have been put into action to support this figure. Walloon and Flander's waste management policy follows the standards of the European Waste Framework Directive. A number of Belgium companies such as Fost Plus, VAL-I-PAC and Recupel have developed eco-innovation solutions to recover waste materials to create economic and environmental values. In Walloon region, the solid waste cluster VAL+, pools over 60 SMEs dedicated to solid waste treatment and valorization. Belgium based companies like Umicore recycles metals to turn them into catalytic converters and fuel cells, Cumerio recycles copper, and CMI Nesa recycles solid waste and ores to electric energy.<sup>29</sup> These companies are putting attention to use energy efficient high technologies during the converting process with household or industrial waste, dangerous industrial refuse or plant waste, contaminated soil or mud and others. Their advanced technologies and solutions are providing eco-innovation solutions on recycling waste management in Belgium.

## Growing Industrial Biotechnology

In Belgium, high priority was gone to funding biotechnology research to promote bio-based economic activities and expand sectoral innovation system.<sup>30</sup> As a result, over 140 biotechnology companies now operate in Belgium, and Belgian biotechnology companies account for 16 percent of Europe's turnover and 10 percent of R&D expenditure.<sup>31</sup> Most of these biotech companies are closely related to pharmaceuticals and agriculture biotech however, industrial biotechnology companies are increasing in Belgium. Industrial biotechnology also known as the "white biotechnology" is used to make enzymes and micro-organisms turn to bio-based products in various sectors including chemicals, food, detergents, paper, textiles and bio-energy. Advanced industrial biotechnology is increasingly known to be an eco-innovation solution that brings positive results in reducing the greenhouse gas emissions. Ghent Bio-Energy Valley (GBEV) is Europe's largest fully integrated bio-energy cluster in Belgium established in 2005. In this cluster, various companies, research

<sup>&</sup>lt;sup>26</sup> Greenwin, http://www.greenwin.be/en

<sup>&</sup>lt;sup>27</sup> Walloon Marshall Plan 2 (2009-2014): continuation and reinforcement of the first Plan, with up-to-date priorities 1) New challenges and opportunities: climate change and greening of the economy, globalisation, 2) Europe 2020 Strategy, 3) Stronger synergies between regional and community (education and learning) priorities, http://www.investinwallonia.be/why-wallonia/economie-etplan-marshall/?lang=en

<sup>&</sup>lt;sup>28</sup> EIO (2011), Eco-Innovation Belgium

<sup>&</sup>lt;sup>29</sup> Federation of Enterprises in Belgium (FEB) (2008), Belgian ecobusiness leading the way

<sup>&</sup>lt;sup>30</sup> UNU-MERIT (2007), Case Study: Biotechnology in Belgium

<sup>&</sup>lt;sup>31</sup> http://business.belgium.be/en/investing\_in\_belgium/key\_sectors/biotechnology/

institutions and service providers related to biodiesel production, biogas technology and other biotechnology solutions are bridged together. It is widely stated that GBEV has made significant performance to grow the biotechnology and products market in Belgium.<sup>32</sup> Further industrial biotechnology development in Belgium will increase the production of bio-fuels, bio-energy, and bio-products, which will eventually contribute to enhancing environmental performance at the national level.

# **Eco-Innovation Case Studies**

#### CASE STUDY 1

#### **Organic Waste Systems**

**Organic Waste Systems (OWS)**, established in 1988, specializes in biological treatment of solid and semi-solid organic substrates through construction and operation of anaerobic digestion plants. Over the years, OWS has developed the DRANCO, SORDISEP and DRANCO-FARM processes. DRANCO process converts solid and semi-solid organic waste into renewable energy, biogas, and a stable end product. SORDISEP process is a wet separation process which can maximize recovery of recyclables and minimize land-filling. Lastly, DRANCO-FARM is a treatment process for pure organic streams such as energy crops and industrial organic waste. Providing these processes, the company is positioning itself as a leading company in Europe for eco-innovation research laboratory in waste management through biological treatment. OWS is also closely associated with the EU project ECOBIONET, a CIP Eco-innovation project, contributing to researching the process and technologies for manufacturing biodegradable and compostable nets.

Source: http://www.ows.be

#### CASE STUDY 2

#### Realco

**Realco**, founded in 1968, has been involved in the field of environmental biotechnology for over 40 years and currently work with private customers as well as industrial clients. Laundry detergent may be one of the essential items in everyday lives, but it also could be one of the items that raise environmental concerns. Chemical ingredients used in detergents are toxic to aquatic organisms and algae and persistent in the environment, and these toxic ingredients may even cause health problem in people such as cancer. Realco's ecological cleaning product allows getting rid of the toxicity used to produce detergents. Instead of using chemical ingredients, Realco uses excellent cleaning properties of natural organism (protein), enzyme, to provide both high level of cleaning performance and environmental benefits. Realco's eco-innovative products are a result of the company's continuous efforts for development of innovative solution through partnerships between its R&D departments and universities and research centers.

Source: https://vbo-feb.be/media/uploads/public/\_custom/Dossier/Energyenvironment/VAN\_ecobizBEL\_ ENv3.pdf

<sup>&</sup>lt;sup>32</sup> Belgian foreign trade agency (2011), Belgian Biotechnology Report

## CASE STUDY 3 Xylowatt

Xylowatt, a Belgian SME, is a member of TWEED cluster and designs, builds, and monitors cost-effective bioenergy systems. TWEED (Technology of Wallonia Energy, Environment and sustainable Development) is one of regional clusters in Belgium, and it aims to promote business development in sustainable energy sectors. Sustainable energy refers to renewable energy sources, the implementation of new process to enhance energy savings and efficiency or to reduce GHGs emissions and the development of products and services in the related area. Xylowatt was created in 2001 as a spin-off of the University of Louvain in a mission to develop and provide eco-innovation technology solutions that produce renewable energy from wood chips and other by-products. Xylowatt's small-scale Cogeneration Heat & Power (CHP) plant is operated based on the thermo-chemical extraction of energy from biomass such as wood, wood waste, agricultural by-products, recovered wood and etc.



Source: http://www.biomassenergy.gr/en/articles/news/solid-biofuels/1186-capital-increase-for-xylowatt http://clusters.wallonie.be/tweed/en/index.html