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Italy: Novamont

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Case study name:

[The greening of industries in the EU](#)

Country:

Italy

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Sectors:

Chemicals

Novamont is a medium-sized company in the chemical sector, an international leader in the development of materials from renewable resources and low environmental impact systems. The production of Mater-Bi materials, which represents the core green business of the company, has been selected as the focus of this case study. The case study illustrates the implementation and challenges of this green practice and exemplifies approaches used by the company to anticipate and manage green change, including the change in the number and quality of jobs.

Introduction

[Novamont](#) is a company created in 1990 in Italy with the ambitious objective – stated in the company's mission ‘Living Chemistry for Quality of Life’ – of combining chemistry, agriculture and the environment. The company is a pioneer in the bioeconomy, as it applies biotechnology in the manufacture of plastics.

This case study focuses on the production of Mater-Bi, a family of fully biodegradable and compostable plastic materials invented and marketed by Novamont.

The impact of the bioeconomy on employment is potentially significant and the Novamont case shows that the prerequisite for job creation is the presence of skilled entrepreneurs and project managers developing and implementing business models, creating new value chains and value-added bio-products. Starting with only a few employees in 1990, employment at Novamont has rapidly increased in recent years, from 136 in 2007 to 179 employees in 2010. This is now projected to increase even more rapidly if an effective European and national bioeconomy strategy is pursued and the legislative framework is improved.

Drivers and motivations

The key drivers and motivations for developing the production of Mater-Bi are those common to bio-based plastic manufacturing:

- awareness of climate change challenges;
- security of energy and raw materials supplies;
- research and innovation offering new opportunities (technical, employment, and others) in all steps from chemical research to the final products and waste management;
- green public procurement which is a key demand factor that will increase the market share of biodegradable and compostable plastics.

The company has not been affected by the global economic crisis. Indeed, after 2007 its revenue and number of employees continued to increase – primarily because the demand for Mater-Bi-based products continued to grow. This is thanks to the decision by some important retail chains in Italy (such as the COOP) to substitute conventional plastic shopping bags with Mater-Bi bags, anticipating the national regulations for this coming into force.

However, there are still important challenges that will continue to drive future research and innovation, including the lower material performance of some bio-based polymers, their relatively high costs of production and processing, and the need to minimise agricultural land use.

Green business practice

The impulse to turn to green business practices began in the 1980s when Montedison, then the biggest company in the Italian petrochemical industry began a joint venture with the agro-industrial company Ferruzzi, to develop products using renewable resources from agricultural origins. A research centre was created to focus on 'Living Chemistry for Quality of Life' and this became later the mission of Novamont, established in 1990 which specialised in bioplastic production.

The company's core business has been to develop products under the Mater-Bi trademark and market them world-wide by promoting a variety of applications in sectors such as agriculture and waste management.

The volume of Mater-Bi sold on the market by the Italian company was 24,000 tonnes in 2010, compared to 2,000 tonnes in 2000.

According to the Novamont Sustainability Report 2010, the share of renewable raw materials used in the production of Mater-Bi is 45%, and this increases in the second generation Mater-Bi (mainly starch and vegetable oil). Mater-Bi itself is an intermediate material used by Novamont's clients in the manufacture of finished products in different sectors, such as separate organic waste collection, farming, disposable tableware and packaging.

These products are fully organically recyclable. This means that, in addition to the lower carbon footprint of bioplastic production, as compared to traditional petrochemical plastics, end of life options are increased and the downward environmental impact and carbon footprint of waste disposal are reduced. This has been assessed by the Novamont life cycle analysis (LCA) required to issue an Environmental Product Declaration for Mater-Bi. [European Bioplastics](#), which represent 75 European bioplastics companies says that LCA shows that the production of bioplastics can enable CO₂ savings from 30% to 70% compared to conventional plastics.

Products made from fully recyclable Mater-Bi create the opportunity to adopt the 'biorefinery' concept. It vertically integrates farmers, the bioplastic industry, and waste management activities into a common "system development" model based on the creation of products with minimal environmental impact which can be returned to the environment by means of organic recycling.

To promote and share this vision of a new development model, Novamont constantly pursues wider involvement by public institutions, the academic world and NGOs by, for example, promoting separate organic waste collection in a growing number of municipalities in Italy and elsewhere.

Anticipation and management of the impact of green change on quantity and quality of jobs

Quantity of jobs

In the last 10 years Novamont has experienced a steady growth of employees. In 2000 company had 80 employees. This number increased to 136 in 2007 and to 179 in 2010. In the same decade, national employment levels in the conventional chemical sector showed a 10% decline according to the Italian federation of the chemical industry, [Federchimica](#).

In 2010 110 employees out of 179 (about 60%) were directly involved in Mater-Bi research and production activities, with the remaining 40% involved in marketing, communication, administration and other general services. The 110 'green' employees are divided into about 30% blue-collar workers (engaged in high-skilled new product testing activities) and about 70% white-collar workers.

The total workforce shows an increase of about 30% in the last five years, notwithstanding the lack of any substantial legislative or regulatory boost for the bioplastic sector in the same period. Between 2007 and 2011, 30% of the jobs were in research and development, while employment also increased in the commercial and production departments (from 77 to 129) and in sustainability and legal affairs (34 to 45).

The company now expects a further growth in employment, depending on the development of the global bioplastics market, and the expected improvement of the national and European legislative framework for the bioeconomy. During 2011–2014 the company estimates employment to increase by at least 30%.

Quality of jobs

The quality of jobs in Novamont is indicated by the share of white-collar jobs, which is approximately 58%. Compared with the chemical sector in Italy, the share of Novamont's clerical workers is significantly higher, while its 35% share of manual workers is lower than the average for the chemical sector (45%).

In this context, Novamont was able to ensure the necessary green skills, to perform adequate training activities and finally to promote communication and cultural activities engaging a variety of stakeholders.

Skills development

Since the firm began, the competences needed were related to the production of bioplastics, including chemical, engineering and biology skills for research, development, production and commercialisation of such products. There are some obvious differences in skills development between employees working with green practice and those performing conventional jobs such as administrative functions, human resources, and general services. Due to the nature of the company's business, the work of employees involved in green jobs is relatively more qualified. White-collar jobs in Novamont require generally a medium-to-high education level and generic green skills, such as:

- green marketing;
- environmental impact assessment skills;
- skills in life cycle assessment;
- ecology of products;
- environmental communication;
- certification;
- environmental legislation related to biodegradable and compostable materials;
- agricultural skills for Mater-Bi applications in agriculture.

Manual workers are not required to develop specific green skills, as their tasks are substantially similar to those of conventional production processes.

The company has always managed the green change mainly by internal training. As illustrated in the company's corporate social responsibility (CSR) report 2010, the average number of hours of training excluding those related to safety issues and the initial training for new employees are almost 27 per office worker, almost 20 per manager, and less than 2 per manual worker. The intensity of training is not differentiated across different categories of green and conventional employees. According to the CSR manager,

Novamont's business is based on scientific research and innovation. The company therefore ensures that the training of all its employees is aimed to share with them the culture and values of sustainable development – not only from the economic point of view, but also with regard to the environment and society – as well as to increase their soft skills and competences.

Training organised by Novamont is not only intended for employees of the company, but also for networks of external bodies who recognise Novamont's vision and project as a model to follow. Novamont is enhancing its role as a training centre, working in collaboration with universities, academic partners, bank-created foundations and research centres. The company's increasing participation in regional, national and EU research and development projects allows for the acquisition of new knowledge and technical skills.

The most active partner is the East Piedmont University, which has established, in cooperation with Novamont, a master's degree in biotechnology for the bioplastics industry, funded by the Piedmont Region and addressed to first-level graduates. It also trains professionals to be able to design new molecules and macromolecules. A success factor enabling the collaboration is the cultural sensitivity of the decision makers involved (Piedmont Region). Collaboration still continues with new training projects. The key driver is cultural, as the company believes there are durable although intangible benefits from such collaboration with the university, beyond just the delivery of new products on the market.

The company is an active member of national and international associations, such as the [Kyoto Club](#) and [Federchimica](#).

Other dimensions of job quality

The company is certified BS OHSAS 18001 and – as it considers the health and safety of all its employees to be of prime importance – voluntarily increased the number of meetings and reviews of the health and safety management system. However, health and safety standards are not significantly different to those applied for the production of conventional plastics.

Security of employment is higher in Novamont – where the number of employees is growing – than in the conventional chemical industry, where jobs are declining. In 2010 most of the employees (88%) had a permanent contract, and the remaining 12% had apprenticeship contracts. These figures can be compared with an average of 45% of permanent contracts for the conventional chemical industry in 2009. All Novamont employees are covered by the National Collective Labour Agreement for Chemical Industry Employees. The company has always been willing to employ young people: a substantial share of its employees (39%) is under 30 years of age.

Novamont's staff is composed of 19% women and 81% men. However, the share of women is higher (38%) in office jobs. Novamont ensures gender parity in terms of access to employment, training, career development and average wages, and retirement options. The assurance of workers' rights and participation is fairly good. As for information and consultation procedures, the company approach goes beyond legislative requirements. In 2010, the number of people involved in the compulsory and optional periodic meetings was 20 (instead of the seven required by the regulations).

Difficulties and success factors

The most significant difficulty in the anticipation and management of the green change of the company was more external than internal, due to the lack of awareness in the upstream and downstream stages of the Mater-Bi value chain, and the consequent difficulty in changing suppliers' and consumers' behaviour towards sustainable production and consumption practices.

One critical success factor in anticipation and management of the green change was however also external – the crisis of waste management in the city of Milan in the 1990s. The response to this crisis was the innovative – at that time – practice of separate collection of the organic fraction and, consequently, the emerging opportunity for biodegradable and compostable plastics captured by Novamont.

The role of public funds to support research and innovation is also important, at EU, national and regional levels. In 2010 Novamont developed two research projects funded by the European Commission for the creation of new products and processes, namely, the [SustainComp](#) Project, to develop sustainable composite materials, and the [ReBioFoam](#) Project, to create biodegradable foam for packaging. Access to additional financial support has enabled research activities that the company could otherwise not afford, at least at the scale typical of larger EU projects.

Conclusions and recommendations

As the Novamont case study illustrates, creating high-skilled jobs within the bioeconomy depends on success in creating competitive bio-industries. This can ensure employment security and even new jobs in the innovative companies, as well as the preservation of wage levels and workers' rights, which are challenged in the conventional chemical industries and other sectors.

Competitive bio-industries are strongly based on research and innovation and the provision of skilled labour from the education sector. Greater efforts are needed at regional, national and European level to stimulate biological science studies and boost bio-based technical education and training.

Medium-to-long term visions and strategies are needed to develop an integrated approach linking for example sustainable production practices in farming with core bio-industry production and sustainable consumption of fully biodegradable and compostable products. This integrated approach should connect different private and public stakeholders and help to create green jobs not only in the core industry, but also in the upstream and downstream segments of the value chain (for example in the separate collection of organic waste);

European and national research and innovation are needed supply side measures, but they should be complemented by demand-driven measures for fostering the growth of niche markets, welfare and well-being. One way to increase demand-driven innovation is the creation of lead markets. Public procurement is another effective way to create demand for new innovative products and contribute to green jobs creation and/or employment security.

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