The Future of European Sustainable Consumption and Production

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*European Roundtables*for Cleaner Production (ERCP) started in1994.Since the 9th conference in 2004with the new title European Roundtablefor Sustainable Consumption and Production (ERSCP,they have received a lot of attention up to this 18thevent. As defined by the Oslo Symposium in 1994, SCP is about *"the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations"*.The concept of SCP was later recognized in the Johannesburg *Plan of Implementation*, adopted in 2002 at the World Summit on Sustainable Development (WSSD).

The eight United Nations' (UN) (MDGs) have made an enormous contribution in raising public awareness, increasing political will and mobilising resources to end poverty. In 2015, a newUN 2030 Agenda for Sustainable Development was adopted, with17 Goals and 169 targets. The Goal no.12is to*ensure sustainable consumption and production patterns*. Addressing social and economic development within the carrying capacity of ecosystems and decoupling economic growth from environmental degradation is an essential requirement for sustainable development.Paragraph 28 of the Agenda reads: *»We (Countries) commit to making fundamental changes in the way that our societies produce and consume goods and services«.* The Goal contains eleven targets ranging from managing natural resources, wastes, and chemicals to tasks of countries, companies,and general public.

The European Commission (EC) presented the *Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan*in 2008,already. It included a series of proposals on sustainable consumption and production that should contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies. The EU made a positive and constructive contribution to the development of the 2030 Agenda for Sustainable Development.A range of publications have been produced highlighting the work the EC is doing to meet the aims set out in the SCP Action Plan.*European SCP Policies*are including: energy and resource efficient economy, circular economy, eco-innovation, eco-design, eco-management and audit scheme, eco-labelling, green public procurement, integrated product policy, waste prevention and recycling, etc.

Eurostat is reporting on Resource productivity by Resource use and waste with 8 indicators, and Consumption and Production patterns with 2 and 4 indicators, respectively. Key trends are explained, too. According to the Globescan's sustainability survey, experts are critical about society's achievements in Global Goal 12 – only 4 % rate it as very good or excellent, and 59 % as poor or fair while it ranks 3rd within the most important Goals (after Climate Action, and Quality Education, together with Peace, Justice and Strong Institutions). Inside organizations it is receiving even the 2nd place in attention, after the Climate Change, only.

As noted in the European Environment Agency's (EEA's) five-yearly flagship report, The European environment — state and outlook 2015 (SOER 2015), Europe's progress towards decoupling environmental pressures from economic growth in recent years has been incremental rather than comprehensive, and the gains achieved have only partially translated into improved ecosystem resilience and human health. In a rapidly changing global context, Europe needs to accelerate progress towards decoupling significantly (EEA, 2015).If Europe is to achieve its 2050 vision of 'living well within environmental limits' (EU, 2013), it must fundamentally transform its core societal systems, particularly those related to food, energy, mobility and the built environment. Achieving such changes will require 'profound changes in dominant practices, policies and thinking' (EEA, 2015a).Eionet

EU SCP Policies

Sustainable Consumption (SC) is the use of products and services that have a minimal impact on the environment so future generations can meet their needs. It can be regarded on different levels: global, state, region, city, community, company, or individual one. The Paris agreement has been signed at the global level. Strategies, action plans, roadmaps, directives and communications are being accepted on the EU level while laws and other regulations are used at the state level. SC is mostly regarding materials (especially critical raw-materials), energy, water, the resource efficiency, (zero) waste, etc.

Individual consumption is connected with consumption patterns, life cycle thinking, and lifestyles (habits). The European Innovation Partnership on *Smart Cities and Communities* (EIP-SCC) brings together cities, industry and citizens to improve urban life through more sustainable integrated solutions including applied innovation, better planning, a more participatory approach, higher energy efficiency, better transport solutions(car sharing), intelligent use of Information and Communication Technologies (ICT). Education for sustainable development (ESD) has to be mentioned in this context, too. Smart home, mobility, food consumption, and carbon footprint are typical keywords here.

The Sustainable Consumption Research and Action Initiative (SCORAI) is a knowledge network of professionals working at the interface of material consumption, human well-being, and technological and cultural change. They aim to foster a transition beyond the currently dominant consumer society.

Sustainable Production is the creation of goods and services using processes and systems that are: non-polluting, conserving of energy and natural resources, economically viable, safe and healthful for workers, communities, and consumers. Typical keywords are: circular economy, cleaner production, pollution prevention, integrated pollution prevention and control (IPPC), best available techniques (BAT), responsible care, process optimization, energy integration, recycling, reuse, repair, regeneration, remanufacturing, renewable resources, factor X, eco-efficiency, industrial ecology, supply chain, life cycle assessment, doing more with less, environmental accounting, social responsibility, and global reporting initiative.

Europe has been at the forefront of industrial revolutions and technological innovations. The industry directly employs over 34 million people across all Member States,and indirectly accounts for millions of additional jobs in related sectors. Between 2000 and 2014, the share of manufacturing in total EU output fell from 18.8 % to 15.3 %, while 3.5 million manufacturing jobs were lost between 2008 and 2014. Therefore, together with 124 other associations representing the European manufacturing industry, the European Automobile Manufacturers' Association (ACEA) has signed a joint declaration calling on the European Commission to support an ambitious EU industrial strategy.They call on the European Commission to:

- Reaffirm its commitment to reaching the Junker’s target of 20% of GDP from industry, with an ambitious and realistic timeline;
- Adopt an Action Plan to tackle the challenges that the industrial sectors are facing, in the framework of a Communication that would include concrete steps and milestones;
- Commit to implement this Action Plan in a timely manner, and regularly report on progress.

Member States clearly stated their full support for a strong European industrial strategy via the European Parliament Resolution on the need for a European reindustrialisation policy and the European Council Conclusions calling to strengthen and modernise the EU’s industrial base.

Sustainable product provides environmental, social and economic benefits while protecting public health and environment over their whole life cycle, from the extraction of raw materials until the final disposal.It has six characteristics: customer satisfaction, dual focus (environmental and social), life-cycle orientation, significant improvements, continuous improvement, and competing offers.

The EU has mainstreamed policies through the *Sustainable Development Strategy* (SDS), and the *Environmental Technologies Action Plan* (ETAP) for which SCP is a priority, and they are also highlighted in the *Europe 2020* strategy. Europe needs economic growth in order to create jobs. In order to make growth sustainable, EC adopted the *Package on the Circular Economy*. Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. It is the biggest EU Research and Innovation programme ever – nearly 80 G€ (billion euros) will be available over 7 years (2014–2020) in addition to private investment that it will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market. It is structured around three pillars ('mutually reinforcing priorities'): excellent science, industrial leadership and societal challenges.

EC prepared an Interim Evaluation of H2020 for the period 2014–2016. The EU still spends too little on R&I (the 3% R&D expenditure target has not been met but Horizon 2020 only represents a small proportion of the total public R&D spending in the EU) and the innovation gap with key competitors still exists, even though performance is improving. The attractiveness of the Programme led to very low success rates (11.6 % compared to 18.5 % in FP7), leaving some parts strongly underfunded. An additional 62.4 G€ would have been needed to fund all the high-quality proposals evaluated. The programme falls behind the expenditure target for sustainable development and climate change although it represents a considerable increase compared to FP7.

EC has improved monitoring of Horizon 2020 projects by using quantitative indicators. According to the EC *Interim Evaluation of Horizon 2020*, EU-13 member states (MSs) received 8.5 % share of participation in Horizon 2020 during the years 2014–2016, and 4.4 % share of EU financial contribution while their population reached 20.6 % of the EU one in 2016. Annual EC contribution per inhabitant is 3 EUR in EU-13 while it is 15 EUR in EU-15. Therefore, the fractions of participation shall be increased to 20 %, and their total funding to 10 % in FP9 by taking part in the cross-border projects together with EU-15, and even more with the EU-14. Two examples from a study made in Slovenia:

- Slovenia is 3rd out of EU-28 MSs according to project applications but only 27th when financed projects are regarded – because it is a small country, although the quality of the financed projects with Slovenian participation is above EU average, and the fraction of enterprise participation reached 48.2 % (EU average was 28 %).
- On the other side the participation of universities dropped to 17.6 % (the EU average being 38 %) what is a threat to the quality of Slovenian education system and graduates.

The abandoned rule that each EU project proposal was including one of the EU-13 MSs shall be awoken. Let us move additional research, innovation and production to EU-13 instead of moving people from EU-13 to EU-15 (brain drain).

The reviewers of the H2020 projects are often not always objective in their evaluations. They are strongly biased, favouring big and developed member states, and big companies in them. We have seen a lot of lobbying and financial agreements before reviewing, in particular in some project areas. Therefore, we are proposing to EC the following anticorruption measures:

- Statistical analysis on project reviews shall be made to identify non-logical evaluation, e.g. 2 or 3 evaluations 4–5, 4th one 2, or vice versa.
- Court of appeal shall be organized from top experts to evaluate statistical extra-ordinaries and complaints.
- Reviewers found to have misused their status (non-ethical behaviour) shall be punished financially, and eliminated as reviewers in future evaluations.
- All lobbying contacts have to be recorded to the Commission which forwards them to the reviewers and to the Court of Appeal.

EU SCP Future

Future is impossible to predict. Some trends can be observed to forecast near future, only. **Megatrends** are 'large, social, economic, political, environmental or technological changes that are slow to form. Once in place, they influence a wide range of activities, processes and perceptions, both in government and in society, possibly for decades' (CSG, undated). They are large, transformative global forces that impact everyone on the planet, e.g.:

1. Demographic and social changes (population growth, ageing, education; poverty, inequality, migrations) with diverging global population trends (fertility, mortality)
2. Changing disease burden and risks of pandemics
3. Rapid urbanization (megacities, smart homes, mobility, security)
4. Regional instability (crises, economic and financial shocks, conflicts and wars) – increasingly multipolar world
5. Shift in global economic power from G7 to E7 (China, India, Brazil, Mexico, Russia, Indonesia, Turkey)
6. Continued economic growth?(limits to growth, beyond GDP initiative, human happiness)
7. Accelerated technological breakthroughs (ICT, robotics, drones, nano-, bio-, eco-technologies, renewables, health care, low-carbon solutions)
8. Growing pressures on ecosystems (population, food and energy consumption, water scarcity,mobility, decline in biodiversity), happy planet?
9. Increasingly severe consequences of climate change (global warming,deforestation, desertification, natural disasters, extreme weather), hysteresis effect
10. Increasing environmental pollution load(air pollution, land releases of nutrients from agriculture and wastewater,water and marine pollution)
11. Resource scarcity (water, critical raw-materials, fertile land, forests) – intensified global competition for resources (prices volatility, potential conflicts)
12. Diversifying approaches to governance (due to globalization, governments are facing a mismatch between long-term, global, systemic challenges facing society, and their more national and short-term focus and powers).

Cyclic nature of human development – Kondratiev's cycles: the 6th wave (clean technology, resource efficiency?).

As an example of future thinking let us take the European Technology Platform (ETP) Sustainable Chemistry (SusChem). It is a forum that brings together industry, academia, policy makers and the wider society. "Sustainable chemistry … seeks to improve the efficiency with which natural resources are used to meet human needs for chemical products and services. It encompasses the design, manufacture and use of efficient, effective, safe and more environmentally benign chemical products and processes. It … stimulates innovation across all sectors to design and discover new chemicals, production processes, and product stewardship practices that will provide increased performance and increased value while meeting the goals of protecting and enhancing human health and the environment"(OECD).

ETP SusChem held its 15th annual Stakeholder event at Brussels in June 2017. The main theme was '*Accelerating innovation and impact in Europe: Shaping expectations and priorities for the next EU Framework Programme (FP9)*'. The event brought together senior players from the big chemical and biotechnology industries, Small and Medium Enterprises (SMEs), academia, research technology organisations (RTOs), and the European Commission (EC) to address common challenges and debate priorities crucial to the sustainability of the European chemical and biotechnology innovation sectors.SusChem Chairman Dr KlausSommer stated that "85 % of the input on topics found in SusChem's Strategic Innovation and Research Agenda (SIRA) is now reflected in Horizon 2020 programmes".

SusChem provided an example for synergy of EU Funding Schemes in the run up to FP9: LAB–FAB–APP, Investing in the European future we want. The SusChem flagship F3 Factory project is an example how to leverage EU research funding with the use of the European Structural Funds (ESI).

We need research ('Labs), innovation competitive fabrication ('Fabs'), and application for the benefit of all ('Apps').

Priorities. Europe is at a crossroads, we need transformational actions to boost competitiveness, jobs and inclusive growth. At the same time, we need to deal with the consequences of climate change and resource depletion that affect European society in far-reaching ways.These challenges can only be tackled by placing sustainability at the heart of all solutions, and sustainable chemistry has a central role to play. We need technological breakthroughs if we want to:

- Significantly cut emissions of carbon dioxide and other pollutants;
- Develop sustainable and renewable energy sources;
- Find alternatives to scarce raw materials;
- Embrace the concept of a circular economy and increase our recycling and reuse of waste;
- Ensure the quality of our water supplies, andsustainable *water* solutions;
- Improve our quality of life without compromising that of future generations.

The primary **policy vision** driving SusChem's thinking and initiatives is of a sustainable low-carbon economy in Europe that can avert or adapt to the impacts of significant climate change and support a dynamic innovation and industrial eco-system. To make this transition, the European Commission suggests that by 2050, the EU should have cut its greenhouse gas emissions by at least 80% compared to 1990 levels. SusChem's5 main policy directions to help build a low-carbon economy are:

1. *Competitiveness* to drain economic growth and retain employment;
2. *Circular economy* to 'close the loop' for product lifecycles bygreater recycling and re-use;
3. *Energy union* for secure, affordable and climate-friendly energy;
4. *Bio-economy*to cope with a growing global population, depletion of resources, increasing environmental pressures and climate change;and
5. *Digital single market* to exploit information andcommunicationtechnologies achievements.

The chemical sector's key enabling **technologies** provide the critical building blocks for the solutions needed to achieve a *sustainable low carbon circular economy*. They impact all value chains including energy, construction, mobility and electronics,and can be categorised into 3 inter-connected areas:

- *Advanced Materials* for: energy production and storage, polymer composites for vehicles, health and well-being, consumer goods, and energy efficiency of buildings;
- *Process*: control, intensification, downstream processing, catalysis and feedstock;
- *Digital*: cognitive and connected plants, big data, digital platforms, and digital skills.

The platform provides an open and collaborative space for a vibrant community of European researchers and innovators to formulate and implement ideas that address major societal challenges. They support their enthusiasm for sustainable chemistry through a series of core **Initiatives**:

- Establish a number of *Public Private Partnerships* (PPPs) to accelerate research and innovation in key industrial sectors – in particular the 'Sustainable Process Industry through Resource and Energy Efficiency' (SPIRE), and the Bio-based Industries Joint Initiative (BBI JU);
- *National Technology Platforms* (NTPs) help to connect ETP SusChem thinking with national and regional programmesand facilitate transnational collaboration;
- *Working groups*, expert workshops and ad-hoc stakeholder discussions on specific elements of the SusChem strategy and its research and innovation agenda as required by its work programme and directed by the SusChem board;
- *GRANT-IT*one step access to search for funding, identify project opportunities, propose project ideas and search for potential project partners;
- *The SusChem Guide to SME funding in Europe* with 5 EU funding programmes
- *Educate to Innovate* programme is part of SusChem's strategy to facilitate a continuing, constructive dialogue and create synergies between the chemical industry and higher education (HE).

There are 2 face to face member meetings organized each year:

- The **SusChem Stakeholder Event**in June is the most influential annual event, high-level panel debate to discuss ETP and NTPsachievements in the last year, and duties in the future years;
- The **SusChem Brokerage event** takes place inOctober as a unique opportunity for industry, academia, SMEs and other actors to develop consortia and submit funding proposals targeting the H2020 2018 and 2019 calls.

Future EU Research & Innovation **Framework Programme (FP9)** key messages are:

1. Innovation
2. Industry
3. Impact

In the design of the next R&I Framework Programme, FP9, Cefic recommends addressing:

1. A competitive innovation ecosystem with
    a. Public Private Partnership
    b. Common and Coherent R&I policy across Europe
    c. Definition of Research Missions (e.g. energy storage systems)
    d. Innovation Programmes and Legislation development
2. A Balanced R&I Portfolio with:
    a. Low and High TRL (Technology Readiness Level) projects
    b. Whole Innovation Ecosystems (active participation of academia, private, and public sector)
    c. Risk and Reward – integrated approach management associated with new ideas.
3. A Competitive EU Manufacturing Base with innovative materials and processes; priority innovation themes: resource efficiency, utilisation of alternative feedstock (including biomass), climate change and energy efficiency, catalyst development, reactor & process development, ICT & process digitisation, materials application development, and mobility and transport. Transformation into Circular Economy and Low Carbon Economy calls for investing in the future mind-set with Key Enabling Technologies (KETs) backbone.
    a. Breakthrough Process Technologies (intensive, efficient, flexible, robust, and tolerant)
    b. Market Enabling Materials (energy in buildings, energy production & storage), R&I support for materials: steel, glass, chemistry, transportation, energy, non-ferro, etc.
4. Sustainable Development & Impact – Industry Role in:
    a. Society (health & Aging, digitisation, resources & energy, globalisation & urbanisation)
    b. Environment experiences (sustainable energy, circular economy, climate change)
    c. Economics (competitiveness, value added, technology leadership and differentiation

    Intellectual Property (IP) strategy (open: innovation, science, to the world).

Some important research areas are **not included** in the future SusChem programme/priorities:

- Carbon capture and storage/sequestration (CCS) to reduce Green House Gas (GHG) concentration in the atmosphere – investing to reverse the climate change / global warming;
- Chemical photosynthesis of hydrocarbons from carbon dioxide and water using sun energy;
- Biorefineriesfor crop, forest, wood, feed, and food rests to chemicals;
- Organics in waters, waste, sludge and biomass to biogas and energy production;
- Microplasticsrecovery from sea and their reuse;
- Chemical leasing business models in industry.

ERSCP

ERSCP conferences have been covering production and industrial consumption. Cooperation with the Sustainable Consumption Research and Action Initiative (*SCORAI*) network helped to include elements of consumers' behaviour (the network is including professionals working at the interface of material consumption, human well-being, and technological and cultural change).Occasional cooperation with the Environmental Management for Sustainable Universities (EMSU) network was

beneficial for the ERSCP conferences participants, too. I am also suggesting to invite the European Environment Information and Observation Network (Eionet) in future conferences. Closer contacts with the Asia Pacific RSCP and the African RSCP as well as the Global Network for Resource Efficient and Cleaner Production (RECP net) and their Cleaner Production Centres (CPCs) memberswould be welcome.

Sustainable Consumption and Production

Goal n.12 of the 2030 Agenda for Sustainable Development aims to ensure sustainable consumption and production patterns.

Paragraph 28 of the 2030 Agenda reads: *"We (Countries) commit to making fundamental changes in the way that our societies produce and consume goods and services. Governments, international organizations, the business sector and other non-state actors and individuals must contribute to changing unsustainable consumption and production patterns, including through the mobilization, from all sources, of financial and technical assistance to strengthen developing countries' scientific, technological and innovative capacities to move towards more sustainable patterns of consumption and production. We encourage the implementation of the 10-Year Framework of Programmes on Sustainable Consumption and Production. All countries take action, with developed countries taking the lead, taking into account the development and capabilities of developing countries"*.

As defined by the Oslo Symposium in 1994, sustainable consumption and production (SCP) is about *"the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations"*.

The concept of sustainable consumption and production was later recognized in the Johannesburg Plan of Implementation, adopted in 2002 at the World Summit on Sustainable Development (WSSD). On that occasion, sustainable consumption and production was identified as one of the three overarching objectives of, and essential requirements for, sustainable development, together with poverty eradication and the management of natural resources in order to foster economic and social development. It was acknowledged that fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development.

The Johannesburg Plan of Implementation also called for all countries to promote sustainable consumption and production patterns, with the developed countries taking the lead and with all countries benefiting from the process, taking into account the Rio principles, including, inter alia, the principle of common but differentiated responsibilities as set out in Principle 7 of the Rio Declaration on Environment and Development.

Furthermore, the Plan called in its Chapter 3 "Changing unsustainable patterns of consumption and production" for governments, relevant international organizations, the private sector and all major groups to play an active role in changing unsustainable consumption and production patterns and more specifically,through its Paragraph 15, to *"Encourage and promote the development of a 10-year framework of programmes (10YFP) in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems"*.

The 10- year framework of programme (10YFP) on sustainable consumption and production patterns was adopted at the Rio+20 Conference, through Paragraph 226.

UNEP has been requested to serve as the 10YFP Secretariat and to establish and administer a Trust Fund to support SCP implementation in developing countries and countries with economies in transition. (A/C.2/67/L.45).

The Inter-Agency Coordination Group (IACG) of the 10YFP was established in May 2013, with the participation of 19 United Nations bodies. It is permanently chaired by UNEP and co-chaired for the period 2013-2015 by the Department of Economic and Social Affairs. The Coordination Group has been providing inputs for the development of the 10-year framework programmes and prepared a document on "SCP in the SDG [Sustainable Development Goals] Focus Areas", which was issued in June 2014. The main areas of actions of the Inter-Agency Coordination Group include enhancing visibility within the UN and the raising awareness outside the UN, enhancing coherent inter-agency support for the implementation of the programmes, conducting joint research as well as promoting information exchange and responding to the 10YFP Board.

Goal 12

Sustainable consumption and production is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all. Its implementation helps to achieve overall development plans, reduce future economic, environmental and social costs, strengthen economic competitiveness and reduce poverty. Sustainable consumption and production aims at "doing more and better with less," increasing net welfare gains from economic activities by reducing resource use, degradation and pollution along the whole lifecycle, while increasing quality of life. It involves different stakeholders, including business, consumers, policy makers, researchers, scientists, retailers, media, and development cooperation agencies, among others.

It also requires a systemic approach and cooperation among actors operating in the supply chain, from producer to final consumer. It involves engaging consumers through awareness-raising and education on sustainable consumption and lifestyles, providing consumers with adequate information through standards and labels and engaging in sustainable public procurement, among others.

Facts and figures

- Each year, an estimated one third of all food produced – equivalent to 1.3 billion tonnes worth around $1 trillion – ends up rotting in the bins of consumers and retailers, or spoiling due to poor transportation and harvesting practices
- If people worldwide switched to energy efficient lightbulbs the world would save US$120 billion annually
- Should the global population reach 9.6 billion by 2050, the equivalent of almost three planets could be required to provide the natural resources needed to sustain current lifestyles

<u>Water</u>

- Less than 3 % of the world's water is fresh (drinkable), of which 2.5 % is frozen in the Antarctica, Arctic and glaciers. Humanity must therefore rely on 0.5 % for all of man's eco-system and fresh water needs.
- Man is polluting water faster than nature can recycle and purify water in rivers and lakes.
- More than 1 billion people still do not have access to fresh water.
- Excessive use of water contributes to the global water stress.
- Water is free from nature but the infrastructure needed to deliver it is expensive.

<u>Energy</u>

- Despite technological advances that have promoted energy efficiency gains, energy use in OECD countries will continue to grow another 35 per cent by 2020. Commercial and residential energy use is the second most rapidly growing area of global energy use after transport.

- In 2002 the motor vehicle stock in OECD countries was 550 million vehicles (75 per cent of which were personal cars). A 32 per cent increase in vehicle ownership is expected by 2020. At the same time, motor vehicle kilometres are projected to increase by 40 per cent and global air travel is projected to triple in the same period.
- Households consume 29 per cent of global energy and consequently contribute to 21 per cent of resultant CO2 emissions.
- One-fifth of the world's final energy consumption in 2013 was from renewables.

Food

- While substantial environmental impacts from food occur in the production phase (agriculture, food processing), households influence these impacts through their dietary choices and habits. This consequently affects the environment through food-related energy consumption and waste generation.
- 1.3 billion tonnes of food is wasted every year while almost 1 billion people go undernourished and another 1 billion hungry.
- Overconsumption of food is detrimental to our health and the environment.
- 2 billion people globally are overweight or obese.
- Land degradation, declining soil fertility, unsustainable water use, over-fishing and marine environment degradation are all lessening the ability of the natural resource base to supply food.
- The food sector accounts for around 30 per cent of the world's total energy consumption and accounts for around 22 per cent of total Greenhouse Gas emissions.

Responsible consumption and production – why it matters

What is the goal here? To ensure sustainable consumption and production patterns Why? More people globally are expected to join the middle class over the next two decades. This is good for individual prosperity but it will increase demand for already constrained natural resources. If we don't act to change our consumption and production patterns, we will cause irreversible damage to our environment. If the global population reaches 9.6 billion by 2050, the equivalent the equivalent of almost 3 planets will be required to sustain current lifestyles. What are some of the current consumption and production patterns that need to change? There are many aspects of consumption that with simple changes can have a big impact on society as a whole. For example, each year about one third of all food produced— equivalent to 1.3 billion tonnes worth around $1 trillion—ends up rotting in the bins of consumers and retailers, or spoiling due to poor transportation and harvesting practices, something that businesses need to address. When it comes to consumers, households consume 29 % worldwide switched to energy efficient lightbulbs the world would save US$120 billion annually. Water pollution is also a pressing issue that needs a sustainable solution. We are polluting water faster than nature can recycle and purify water in rivers and lakes. How can I help as a business? It's in businesses' interest to find new solutions that enable sustainable consumption and production patterns. A better understanding of environmental and social impacts of products and services is needed, both of product life cycles and how these are affected by use within lifestyles. Identifying "hot spots" within the value chain where interventions have the greatest potential to improve the environmental and social impact of the system as a whole is a crucial first step. Businesses can also use their innovative power to design solutions that can both enable and inspire individuals to lead more sustainable lifestyles, reducing impacts and improving well-being. How can I help as a consumer? There are two main ways to help: 1. Reduce your waste and 2. Be thoughtful about what you buy and choose a sustainable option whenever possible. Reducing our waste can be done in many ways, from ensuring you don't throw away food to reducing your consumption of plastic— one of the main pollutants of the ocean. Carrying a reusable bag, refusing to use plastic straws, and recycling plastic bottles are good ways to do your part every day. Making informed purchases about what we're buying also helps. For example, the textile industry today is the second largest polluter of clean water after agriculture, and many fashion companies exploit textile workers in the developing

world. If you can buy from sustainable and local sources you can make a difference as well as exercising pressure on businesses to adopt sustainable practices. For more suggestions on what you can do please visit: http://www.un.org/sustainabledevelopment/ takeaction .

Resource Efficient and Cleaner Production (RECP)

Global Network for RECP in developing and transition countries has 30 Members. On the 19th October 2011 they accepted the *Nairobi Declaration* in which they considered and reaffirmed:

1. The critical importance of manufacturing and related productive and service sectors in generating incomes and employment in developing and transition countries as a lasting solution to alleviate poverty, address (emerging) water and other natural resource scarcities and improve quality of life;
2. The need to improve resource productivity and environmental performance of businesses andother organizations to achieve low carbon, resourceefficient and green industrialization in developing and transition countries;
3. The potential for the application of preventive environmental strategies to processes, products and services, further referred to as Resource Efficient and Cleaner Production (RECP) to advance the three sustainability dimensions of:
    a. *Production Efficiency and Competitiveness*: through optimisation of the productive use of natural resources (materials, water and energy);
    b. *Environmental Management*: through the minimization of impacts on environment and nature; and
    c. *Safe and Responsible Production*: through the minimization of risks to people and communities, and enhancing social responsibility.
4. The leadership and achievements of the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP) in promoting the adaptation and adoption of RECP concepts, methods, policies and techniques in over 50 developing and transition countries, including through their support for the creation of *RECP net*.

They declared that they are determined to mainstream and scale-up the application of RECP concepts, methods, policies and techniques in our respective countriesand globally in developing and transition countries based on our national and regional socio-economic, environmental and industrial circumstances and priorities. To that end they have resolved to:

1. Intensify national, regional and global cooperationand the sharing of knowledge, including best practices and techniques, in particular among us members to improve our delivery of such RECP services as information dissemination, professional and ongoing education, technical assistance and policy advice;
2. Engage ourselves at the highest levels with our government, business and community leaders to foster the achievement of international consensus and commitment towards RECP as core building block for a green economy and green industry for achieving green growth, including in particular to contribute to the preparatory process for Rio+20 and the climate technology mechanism under the UN Framework Convention on Climate Change, and consider their outcomes for implementation;
3. Commit ourselves to support the wide-spread adaptation and adoption of RECP concepts, methods, policies and techniques in particular among small and medium-sized enterprises and other organizations in our respective countries;
4. Request the joint UNIDO-UNEP RECP Programme to continue and where possible expand its support to RECP net, including through the provision of executive secretariat, creation of a knowledge management system, support for professional and institutional capacity building and advocacy for RECP net; and
5. Consolidate and expand our network into a worldwidecatalyst for RECP.