



PPE: NAVIGATING A PATH THROUGH CRISIS **A SUSTAINABLE FUTURE**

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WELCOME



It gives me great pleasure to introduce Greenville's second contribution to the conversation taking place around the Climate Emergency. This paper, *A Sustainable Future – PPE: Navigating A Path Through Crisis*, aims to inform the various market players

about the complexities to be considered arising from the significant increase in expenditure (in excess of 1 billion euro in 2020) across the public sector as a result of the Covid-19 pandemic.

We are proud to play a small part in tackling this generational challenge through our research, training and consultancy offerings and look forward to supporting the procurement profession to effect changes in procurement practices which deliver real impact.

We would welcome your feedback on how this paper has achieved its aims of informing and highlighting the issues and the benefits of implementing Green Procurement in your organisation.

Best wishes,



Jeanne Copeland
CEO

Greenville Procurement Partners Ltd.

PURPOSE OF THIS PAPER

This is the second in a series of white papers from Greenville Procurement Partners. The paper sets out to provide the reader with insights on the relevant macro socio-economic and environmental considerations aimed at promoting a greater understanding of the components underpinning effective green procurement.



ABOUT THE AUTHOR

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EXECUTIVE SUMMARY

Under the Paris Agreement of 2015 the EU, on behalf of Member States, committed to a 40% reduction in EU-wide carbon emissions by 2030 compared to 1990 levels to limit global temperature increase to 1.5°C rise over pre-industrial levels.

The Coronavirus* pandemic and climate change are inextricably linked. The destruction of the environment and our rampant consumption of natural resources has pushed nature to the brink, and amplified the negative consequences of climate change.

The critical public health issue we currently find ourselves in has forced us into this conflicting paradigm of protecting ourselves yet imperilling the planet in the process.

PPE (Personal Protective Equipment) waste is everywhere we turn, from our streets and paths, to our ponds, rivers and even our oceans. It is an environmental hazard which will have an ongoing detrimental effect on global public health. We must seek solutions quickly before the problem becomes insurmountable.

The European Green Deal¹ and Circular Economy Action Plan² offer some possibilities. The European Green Deal describes a roadmap by which Europe can navigate the turbulent political and socio-economic waters ahead.

In this, our second in the Sustainable Future Series, we investigate what this means in the context of pandemic and climate crisis and examine the role of **Green Public Procurement**

***“...As we come out of the crisis, we must not fall into old habits, we must not hold onto yesterday’s economy as we rebuild.*”**

On the contrary, we must boldly use this opportunity to build a modern, clean and healthy economy, which secures the livelihoods of the next generation...”

EC President Ursula von der Leyen,
Brussels, May 13th, 2020

(GPP) and our public sector organisations can play in the creation of a more sustainable future for business, society and the environment.

*The terms Coronavirus and Covid-19 are used interchangeably through the text

1. The European Green Deal: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

2. Circular Economy Action Plan: https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

According to the Office of Government Procurement in Ireland (OGP Newsletter July, 2020) a sustainable procurement policy will be developed and implemented to, among other things:

- Ensure strong value-for-money for the taxpayer;
- Seek to minimise the environmental impact and optimise the community benefit of products and services procured;
- Support innovation in supply markets to increase the availability and effectiveness of sustainable solutions;
- Encourage suppliers to adopt practices that minimise their environmental impact and

deliver community benefit; and

- Work in partnership with suppliers to achieve common goals and continually improve performance over time.

Reference: OGP Newsletter July, 2020.

KEY POINTS

- **The European Green Deal and Circular Economy Action Plan could provide the ambition required by the public and private sector to help Europe, and by extension Ireland, to navigate a path through the current pandemic and climate crisis towards a more sustainable future.**
- **Mandatory Green Public Procurement policies will underpin the European Green Deal and Circular Economy Action Plan going forward.**
- **The production, use and disposal of millions of tonnes of single-use PPE materials will result in an environmental waste and public health crisis in the future but working in the context of a circular economy could be one possible solution.**
- **Organisations are rethinking long term business strategy to replace globalised and extended supply chains with local solutions and networks and in this transition they will be supported by incentives for a Next Generation EU and New Industrial Way for Europe.**
- **Urgent dialogue and collaborative action by both the public and private sector could deliver a new and vibrant infrastructure and economy on the island of Ireland into the second half of the 21st Century.**



GLOBAL PERSPECTIVE

The EU President, Ursula van der Leyen, in a recent address to the European Parliament³, encourages Europe post-Covid-19 pandemic to bounce back better, and to use the current crisis as an opportunity to build resilience and a stronger and healthier society.

As part of the European Green Deal envisaged, countries within the EU will build resilience to future shocks by addressing the globalised nature of supply chains, and by reconfiguring industry and the way we do things. This will include the creation of a circular economy.

While the **Circular Economy Action Plan** will encourage a rethink of single-use materials, such as plastics, and in the process consumers, policy makers and other stakeholders will be faced with certain choices. Do we continue with a linear economy where everything is disposable, PPE as an example, or do we use the opportunity to

rethink materials, and how we source, produce and consume them? The answer to that question will be driven in large part by public sector policy and its influence on the marketplace; specifically through the adoption of GPP measures. It will involve a deep evaluation of globalisation as a business strategy in a world now beset by pandemic and a climate crisis, and the growing sense of unease that is prevalent amongst both suppliers and consumers regarding a clear navigable path forward. It will also depend on the appetite for risk, transparency and accountability.

3. Speech by Ursula van der Leyen to the European Parliament: https://ec.europa.eu/commission/presscorner/detail/en/speech_20_877

GLOBALISATION

The main functions of globalised systems of manufacturing and distribution are to minimise the cost of production through material and labour cost optimisation, while maximising profits, increasing shareholder value and meeting the demands of consumers.

The Covid-19 pandemic has illuminated the frailties of globalisation in several ways, including in the free movement of goods, services, and people.

THE IMPACT OF COVID-19 PANDEMIC ON GLOBAL SUPPLY CHAINS

Travel: Closed borders, restricted travel, and delays in the shipment of goods will erode some of the benefits described by proponents of globalisation. Many organizations have been unable to audit supply chains to desired quality standards.

Additionally, labour shortages and altered work processes, have caused delays in inspections and oversight, and have increased the risk of defective materials passing through the system undetected. This could have severe repercussions for the public sector and the services it delivers.

Transparency and Trust: Personal Protective Equipment supply chain disruptions have been impacted by hoarding, price manipulation, unregulated trading systems, defective materials, and interventions in the market by nation states. The obvious consequence is a **breakdown in the levels of trust** between producers, suppliers, and consumers.

Time: Delays in the delivery of essential equipment to point-of-use has severely impacted the rapid deployment of products and services and has increased the levels of risk faced by frontline workers. For globalisation to work effectively it requires, amongst other factors, the free movement of goods, services, people, and information. International trade agreements are also a major facet to be considered. The removal of tariffs on



certain medical products could be one possible remedy and is discussed in more detail in a concept paper from the **European Commission**⁴.

The Covid-19 pandemic has been a fast moving crisis with immediate impacts. The crisis timeline has been short. Climate change however is a slow moving crisis over a longer timeframe but it also has the potential to shear rapidly.

Recovery: The European Green Deal will involve closer links between producers and consumers; a pan-European and regionalised approach to address the fragile global systems currently in place, and mechanisms to minimise risk and promote internal market security. Mobilising and incentivising innovation, research capacity and creating levers of finance to enable a just transition, as well as mandatory Green Public Procurement measures, are the factors which will enable those goals to be met.



4. Trade in Healthcare Products, European Commission, 2020: https://trade.ec.europa.eu/doclib/docs/2020/june/tradoc_158776.pdf

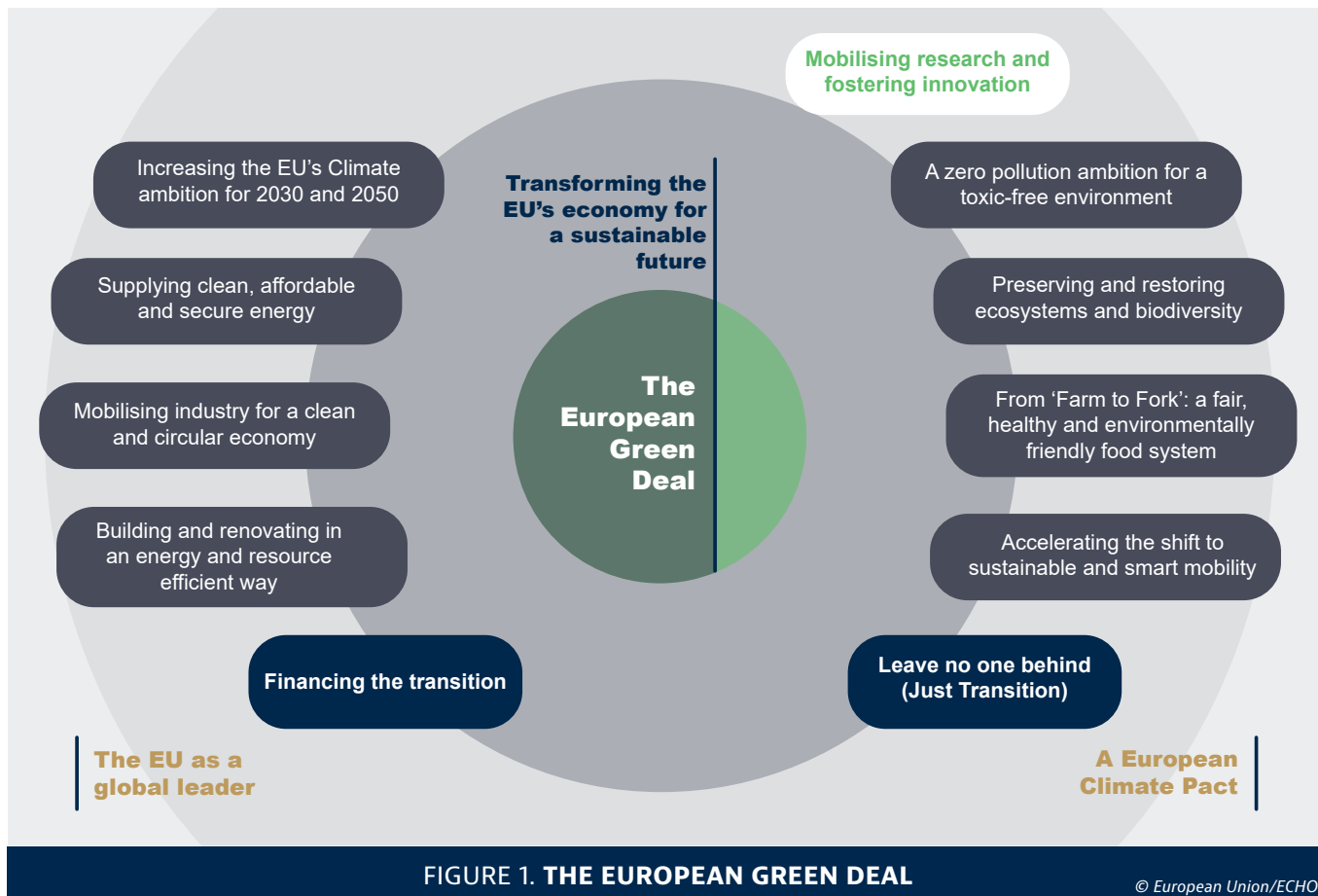


FIGURE 1. THE EUROPEAN GREEN DEAL

© European Union/ECHO

NEW NORMAL

Due to restricted travel, a deterioration in the levels of transparency across supply chains, and a breakdown in trust between market actors, many organizations have sought to **minimise risk** by reacting, re-trenching and reverting to more local and regional suppliers of goods and services. The disruption in global supply lines has also caused nation states to **rethink global partnerships and relationships**. The impact of disruptions to global

networks are seismic, and although it will prove challenging in the short term to fully disconnect from already well-established networks and supply chains, a longer term strategic vision is now required. This will require a systems thinking approach and a determination to empower radical change across the public sector; including in the procurement of goods, works and services.

5. Next Generation EU: https://ec.europa.eu/ireland/news/europe-s-moment-repair-and-prepare-for-the-next-generation_en

EU RESPONSE TO HEALTH CRISIS

In **July 2020** EU leaders reached an historic agreement on the **Next Generation EU⁵** and the long-term budget 2021-2027 which allows the Commission to use its strong credit rating to borrow **€750 billion** on the financial markets.

Through EU4Health⁶, the EU will invest €9.4 billion to:

- Ensure prevention, preparedness, surveillance and response to cross-border health threats.
- Build emergency reserves of medicines, medical devices and other health supplies.
- Establish a Union health emergency team to provide expert advice and technical assistance in case of a health crisis.
- Coordinate emergency health care capacity.

EU4Health will also support innovative medical products and greener manufacturing which should encourage industry, entrepreneurs and third-level research institutions to bring solutions to market faster.

As part of the response the EU Commission also seeks to increase industrial production across three broad areas:

- Masks and other PPE
- Hand sanitisers and disinfectants
- 3D Printing

EMERGENCY SUPPORT INSTRUMENT SUCCESS:



© European Union/ECHO

On June 18th 2020 a pilot operation successfully delivered over seven tonnes of personal protective equipment to Bulgaria.

The cargo included over 500,000 protective masks, purchased by Bulgaria with transport costs covered by the EU.

6. EU4Health for a healthier and safer EU: https://ec.europa.eu/eip/ageing/news/eu4health-healthier-and-safer-eu_en

Using the Emergency Support Instrument⁷ with a budget of €2.7 billion the EU seeks to address:

- Stock inventory across the EU
- Production capacity
- Anticipated need

The European Commission has created a **strategic rescEU⁸** medical stockpile and distribution mechanism under the umbrella of the **Union Civil Protection Mechanism** to enable the rapid distribution of personal protective equipment and other supplies. All EU Member states can host or access the equipment under the stockpile.

Under a **Joint Procurement Agreement⁹** EU Member states and EEA countries, covering **37 countries** and a population totalling **537 million people**, can join forces to negotiate better terms with suppliers.



The voluntary Joint Procurement Agreement for medical equipment enables the joint purchase of such equipment and supplies. The Agreement is now signed by 37 countries, including all EU and EEA countries, as well as Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia and Kosovo*. (*This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.)

Source: https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/public-health_en

HOW DOES THE JOINT PROCUREMENT AGREEMENT WORK?

Enables the large-scale, joint purchase of such equipment and supplies. The European Commission coordinates the exercise in collecting the needs of Member States. It drafts the technical specifications, organises the launch of the procurement procedure, assesses the tenders and awards the contract(s). Based on the awarded contract(s), Member States place their individual orders and purchase the needed medical equipment. So far, four coronavirus-related Joint Procurements have been launched. The first four have a total budgetary ceiling (the maximum value of all combined orders) of €3.5 billion.

Reference: https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/eu-medical-and-health-support_en

7. Emergency Support Instrument: https://ec.europa.eu/echo/what/civil-protection/emergency-support-instrument_en

8. EU Budget for the Future: https://ec.europa.eu/echo/files/aid/countries/factsheets/thematic/2020_rescEU_MFF_en.pdf

9. Crisis Preparedness and Response: https://ec.europa.eu/health/preparedness_response/joint_procurement_en



"... personal protective equipment (PPE) would cost €1 billion per year for the Irish healthcare system and there would be a "similar very significant cost" to establish a testing and contract tracing model for the country."

Statement of the Health Service Executive chief executive Paul Reid reported in The Irish Times, May 10th, 2020.

IRELAND

Several companies have already re-purposed their manufacturing capabilities to address the surge in demand for face masks and other PPE, however Irish manufacturers are still dependent on, amongst other things, imported raw materials (petroleum derived plastics and metals as an example).

Large Irish retailers and pharmacy chains are moving into the distribution space to support the public and private sector, and while their spending power will help leverage the market to keep costs low, they too are dependent on imported materials.

The general trend does however indicate that there is a willingness within private industry to engage in the marketplace for the public good. This is encouraging but we must be careful to proceed with caution. The quality of imported finished goods varies.

Irish manufacturers who intend producing PPE domestically must still import raw materials. Those raw materials must be extracted, processed, transported and processed again, producing carbon equivalent emissions along the way. As procurement professionals we must carefully balance purchasing decisions with environmental protection.

Science Foundation Ireland (The Irish Independent, September 25th, 2020) reports that investigations are under way to develop alternative PPE materials; including more comfortable and reusable face masks, as well as research on how to detect traces of airborne Covid-19 in healthcare and airport environments, and robot-assisted ultraviolet disinfection.

GREEN PUBLIC PROCUREMENT (GPP) FRAMEWORK

GPP is defined as: "A process whereby public and semi-public authorities meet their needs for goods, services, works and utilities by choosing solutions that have a reduced impact on the environment throughout their life-cycle, as compared to alternative products/solutions."¹⁰

GPP is currently a voluntary policy, but will become a mandatory policy in the near future supported by the European Green Deal and Circular Economy Action Plan. GPP is at the centre of the drive for increased levels of sustainability, resource efficiency and the promotion of the circular economy.

The 2014 Public Procurement Directives adopted by the European Parliament and Council in 2014 fully support the introduction of green and environmental criteria in the award of public contracts.

The National Framework for Sustainable Development in Ireland - Our Sustainable Future¹¹

sets out a clear vision and place for GPP in future national governance arrangements and will be further strengthened by the European Green Deal.

GPP could help:

- Create the conditions in which innovation is encouraged and resources used in a more judicious manner
- Ensure compliance with both legislation and standards and allow for ongoing monitoring and improvement
- Signal commitment across the organisation and to external stakeholders to higher levels of social and environmental performance
- Help the EU to meet climate targets

These critical conditions must be considered if the impact of increased consumption of single-use PPE materials is considered to be environmentally damaging.

Life-cycle Costing/Life-cycle Analysis

The application of Life-cycle Costing (LCC) and Life-cycle Analysis (LCA) is core to GPP and allows a deeper understanding of the impacts of products and services from a social, economic and environmental perspective.

Life-cycle Analysis (LCA) is a methodology for assessing the total environmental impact of a product or service over its entire life-cycle. We will examine LCA in more detail a little further on in this paper in our analysis of face mask production and consumption.

Life-cycle Costing (LCC) is a methodology for assessing the total costs of a product or service. Directive 2014/24/EU costs:

“costs, borne by the contracting authority or other users, such as:

- i. Costs related to acquisition

10. Green Procurement: https://ec.europa.eu/environment/gpp/index_en.htm

11. Green Procurement: Guidance for the Public Sector published by the Environmental Protection Agency in 2014: <https://www.epa.ie/pubs/reports/green%20business/GreenPublicProcurementfinalwebv2.pdf>

- ii. Costs of use, such as consumption of energy and other resources
- iii. Maintenance costs
- iv. End of life costs, such as collection and recycling cost
- v. Costs imputed to environmental externalities linked to the product, service or works during its life cycle provided their monetary value can be determined and verified; such costs may include the cost of emissions of GHGs and of other pollutant emissions and other climate change mitigation costs.”

Life-cycle costing allows public bodies to understand costs and benefits not only at investment level but also in relation to operational cost.

We must also seek to reduce, reuse and recycle as much as possible.

REDUCE

Public Health Education: Faster interventions, social distancing, and other public health measures, including training on the correct use of PPE will reduce the amount of materials consumed. A public health messaging system which addresses the correct application, wearing and disposal of PPE is essential.

Prioritisation: One possible mechanism for reducing materials consumed is to make a distinction between essential PPE material designated for use by healthcare staff, and materials needed to ensure public health outside healthcare management facilities. The supply of medical-grade PPE could be restricted therefore to frontline personnel, while the general population could be encouraged to produce their own ‘mask coverings’ from common materials; cotton et cetera, in combination with a filter mechanism. Prioritisation would need to step hand-in-hand with Public Health Education on the proper use of reusable PPE material. Effective use of reusable face

masks could reduce the demand for medical-grade materials and reduce the volume of medical-grade waste going to incineration and landfill.

Technology: The Covid-19 track and trace mobile phone application, COVID Tracker Ireland, launched by the Health Service Executive in July 2020 has also proven quite successful and is providing public policy decision-makers with real-time data.



In the near future bio-wearable devices could reduce the public health burden by flagging potential infection clusters and thereby allowing faster medical interventions, economic recovery and the rebuilding of public trust.

If we are to simultaneously tackle the Covid-19 pandemic and climate crisis, and encourage a return to public transport for instance, we will need to alleviate people’s concerns regarding closer interactions and allow a scaling up of more environmentally-friendly public services. We will need technology to help solve some of those issues.

REUSE

Certain PPE can be reused. In the case of visors, goggles, shoes, and boots, cleaning and sterilisation processes can be put in place. Public health guidance can be given on the appropriate materials, number of uses, cleaning procedures et cetera to reduce the amount of single-use materials among the general population.

RECYCLE

Materials can be sterilised, reused and/or recycled through a standard plastics-recycling process. Single-use materials are, by design, disposable and difficult to recycle in any meaningful way but there are opportunities to recycle packaging. Single-use masks, gloves et cetera will be processed through a bio-hazard waste stream (incineration). In-house disposal of biomaterials could offer one possible solution.

RE-LOCATE

As we have previously noted, localisation of production is not a panacea however Europe has an integrated and innovative industrial base and is well placed to take the global lead in manufacturing of PPE.

An integrated strategy of ‘**green procurement**’ combined with incentives to the Small and Medium Enterprise (SME) sector, research and academic institutions, will ensure that Europe builds resilience to future shocks, and will include a **new industrial way of thinking and acting**.

REDESIGN

At the heart of the Circular Economy Action Plan is a new **sustainable product policy framework**. This will establish sustainability principles for all products, ensuring that Europe’s industry becomes more competitive in the process. We must start from the principle that waste is a failure of design and build from there.

REIMAGINE

A timeline for the realisation of the Circular Economy has been outlined (see Appendix B).

There are some notable milestones, including;

1. Mandatory **Green Public Procurement** criteria and targets in sectoral legislation and phased in reporting on GPP as of 2021
2. Mandatory requirements on **plastic waste reduction** measures and recycled plastic content 2021/2022
3. **EU Strategy for Textiles** 2021
4. **Less Waste/More Value** 2021/2022



PERSONAL PROTECTIVE EQUIPMENT (PPE)

"The Department of Health said it was working with the HSE to finalise orders for the rest of 2020, and that €650 million was approved for PPE purchases in the budget."

The Irish Times, October 29th, 2020

Total exports of PPE, including face masks, hand soap, sanitiser and protective goggles, were valued at \$135 billion on average for the period 2017-2019. Approximately 17% or \$23 billion came from China, followed by Germany and the US. These three exporters account for more than 40% of world exports of protective supplies¹².

Initial data for 41 countries suggests that trade in medical goods grew by 38.7 percent in the first half of 2020. Certain specific products remain subject to periodic shortages, with sourcing a particular challenge for some developing countries.

How WTO members have used trade measures to expedite access to covid-19 critical medical goods and services

World Trade Organisation, September 15th, 2020

- Increased movement restrictions
- Lack of transparency in existing supply chains
- Defective material rates from both new and existing suppliers in the market
- Security of supply concerns
- Inadequate customs inspection and auditing processes at place of manufacture and arrival
- Opaque labour standards increasingly impacted by lack of oversight
- Lack of reciprocity – for example, state actors intervening in the market for domestic purposes

Factors driving the market for PPE

- Public Health management
- Constriction in supply for PPE globally
- Number of available suppliers in the marketplace
- Cost of raw materials
- Export controls
- Reduced air freight capacity
- Reduced workforce nos. at airports, warehouses and ports

With patient health and safety as a guiding principle, the European Parliament and the Council adopted Regulation (EU) 2020/561 of 23 April 2020 amending Regulation (EU) 2017/745 on medical devices as regards the dates of application of certain of its provisions. This Regulation postpones the date of application for most provisions of the Regulation (EU) 2017/745 on medical devices by one year.

Source: European Union Coronavirus response in relation to personal protective equipment.

Guidance for Manufacturers: Conformity assessment procedures for protective equipment 13/07/2020

12. Trade in Healthcare Products, European Commission on Trade, 2020 – World Trade Organization: https://trade.ec.europa.eu/doclib/docs/2020/june/tradoc_158776.pdf



In March 2020 the Irish government asked Aer Lingus to run supplies out of Beijing, China.

Approvals for a new Dublin-Beijing route would usually have taken six months but airline liaising with the Department of Foreign Affairs, the Department of Tourism, Transport and Sport, and with the Embassy of China achieved visa approval in just 10 days. By mid-April, Aer Lingus had completed 30 Beijing flights.

DEFINITION

Article 3 Regulation (EU) 2016/425 defines PPE as equipment designed and manufactured to be worn or held by a person for protection against one or more risks to that person's health or safety. PPE is governed by the REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) Regulation – (EC) No 1907/2006. PPE needs to comply with EU legislation, and compliance is indicated either directly by the 'CE' or 'EN' symbol.

A majority of the products used in the context of the current health crisis, including FFP-type masks, are considered as Personal Protective Equipment (PPE) and hence fall under the scope of Regulation (EU) 2016/425. Other products such as medical gloves and medical face masks are products falling within the scope of the EU legal framework on medical devices – Council Directive 93/42/EC, to be fully replaced by Regulation (EU) 2017/745 as from 26 May 2021.

TYPES OF PPE

- Face Masks/Visors/Goggles
- Aprons/Gowns/Scrubs
- Gloves/Shoe coverings
- Hairnets
- Cleaning Fluids
- Hand Sanitisers
- Hazardous Material Containers

Deep cleaning procedures will need to be implemented on a more frequent basis across all sectors. This will require increased consumption of cleaning fluids, including; detergents, bleaches and surface cleaners. The vast majority of cleaning fluids used by public sector and contracting organisations fall under the category of hazardous substances and therefore detrimental to the environment. Long term solutions which have a benign impact on the environment will need to be implemented.

SECTORS

HEALTHCARE

In the early stages of the Covid-19 pandemic the healthcare sector was the primary focus when discussing the consumption of PPE. However, as economies open up other sectors will face increasing pressure to institute social distancing and personal protection measures. Among public sector organisations this will include Education, Construction and Local Authorities.



EDUCATION

Significant preparation work has been undertaken to ensure the safe reopening of creches/schools and colleges. Building design changes will be essential in the long term to ensure adequate social distancing measures and air quality. In the short-medium term students, teachers and administration staff will encounter different types of PPE interfaces including hand sanitising stations, masks, gloves and visors amongst other measures.



LOCAL AUTHORITY

Local authority buildings such as council offices and public services operating from same will need to implement virus transmission counter-measures. Office spaces will be reconfigured to ensure adequate distancing between co-workers and will include screens, cleaning stations, reduced staffing numbers and flexible work arrangements. PPE for public sector staff will be required.

CONSTRUCTION

The construction sector has implemented PPE measures and testing procedures however with increasing levels of activity in the sector more rigorous adherence to social distancing and application of PPE will be required.

PUBLIC TRANSPORT

The Coronavirus pandemic has created unseen difficulties for users and supporters of public transport. While efficient, zero-polluting and cost-effective public transport systems are seen as essential solutions to the challenges of mass transportation and climate change mitigation into the future the Coronavirus has presented a series of unique challenges; the virus spreads through human contact, aerosol and droplets. Public transport provides an ideal environment for virus transmission.

Public transport can be safe, and can also be an environmentally-friendly means of mass transportation, if the correct measures are put in place. Those measures will include hand sanitizing stations, mandatory mask wearing, staggered seating and standing arrangements with perspex screens, more frequent and less crowded services. Lower emissions vehicles, bulk-buying of hand sanitizing gels, cashless-payment points, on-board public information announcements regarding the correct wearing and disposal of PPE, can all work to both protect people and the planet.

"... the change in definition on the use of face masks by all healthcare workers has meant the daily use of face masks across the health system has gone from 200,000 to 1.2 million, leaving the HSE with a requirement for 9 million face masks a week."

Statement of the HSE chief executive Paul Reid reported in the Irish Times, May 10th, 2020

FACE MASKS

The face mask has become a symbol of the Coronavirus pandemic. A recent announcement from the **World Health Organisation**¹³ stated, 'to prevent COVID-19 transmission effectively in areas of community transmission, governments should encourage the general public to wear masks in specific situations and settings as part of a comprehensive approach to suppress SARS-CoV-2 transmission.' The World Health Organization recommends an increase in production of 40% on

13. Advice on the use of masks-WTO ([https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-\(2019-ncov\)-outbreak](https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak))

current volumes. In 2020 China's share of the face mask industry increased to 85%. The global market for disposable face masks was worth \$75 billion in the first quarter of 2020 and is expected to grow at a rate of over 50% for the next seven years. With little oversight by end users over the manufacturing and testing process, consumers could be deceived by claims concerning efficacy and labour practices. Several countries have already refused and returned shipments of PPE because of defective and/or non-standard materials.

The true extent of the global supply chains is complex and includes suppliers and distributors of raw materials and packaging materials, labelling suppliers, manufacturers of processing equipment, transportation networks, information systems and procurement systems.

Between March and April 2020, China exported approximately 27.8 billion face masks.¹⁴

Manufacturing Process

A surgical mask (**European Standard EN 14683:2014**) is a single-use device made to act as barrier to droplets or aerosols and covers the mouth, nose and chin. Surgical respirators or filtering face piece (FFP) manufactured to (**European Standard EN 149:2001+A1:2009**) are made to filter out airborne particles including viruses and bacteria and are CE marked as medical devices, available as FFP1, FFP2 and FFP3 where the higher numbers correspond to better filtering efficiency.

Filtering face pieces are designated as 'R' (Reusable for multiple-shifts) or 'NR' (Non-reusable for single shift usage only). Both surgical masks and respirator application are governed by the **Health Products Regulatory Authority¹⁵** (HPRA) in Ireland.

In the context of COVID-19 the European Commission issued a Recommendation on March 13th, 2020 to facilitate the rapid uptake of new products on the EU market. Under Market Surveillance the Recommendation also states that:

The relevant market surveillance authorities in the Member States should as a matter of priority focus on non-compliant PPE or medical devices raising serious risks as to the health and safety of their intended users

Source: Commission Recommendation (EU) 2020/403 of 13 March 2020 on conformity assessment and market surveillance procedures within the context of the COVID-19 threat: C/2020/1712

In the case of face masks, the harmonised standards are EN 149:2001+A1:2009 for the FFP-type masks and EN 14683:2019+AC:2019 for medical face masks. Medical face masks are manufactured by converting polymers, using a heat-extrusion method, into submicron diameter fabric. In a spun-bond process fibres bond with each other as they cool. In a melt-blown process high-velocity hot air is blown on the extruded fibre to obtain ultrafine sub-micron filaments.

Raw Materials

Surgical masks have a multi-layered structure and are most commonly made of polypropylene, polyethylene or PET polyester. Nose clips are generally aluminium. Ear loops can be rubber/latex or cotton/nylon.

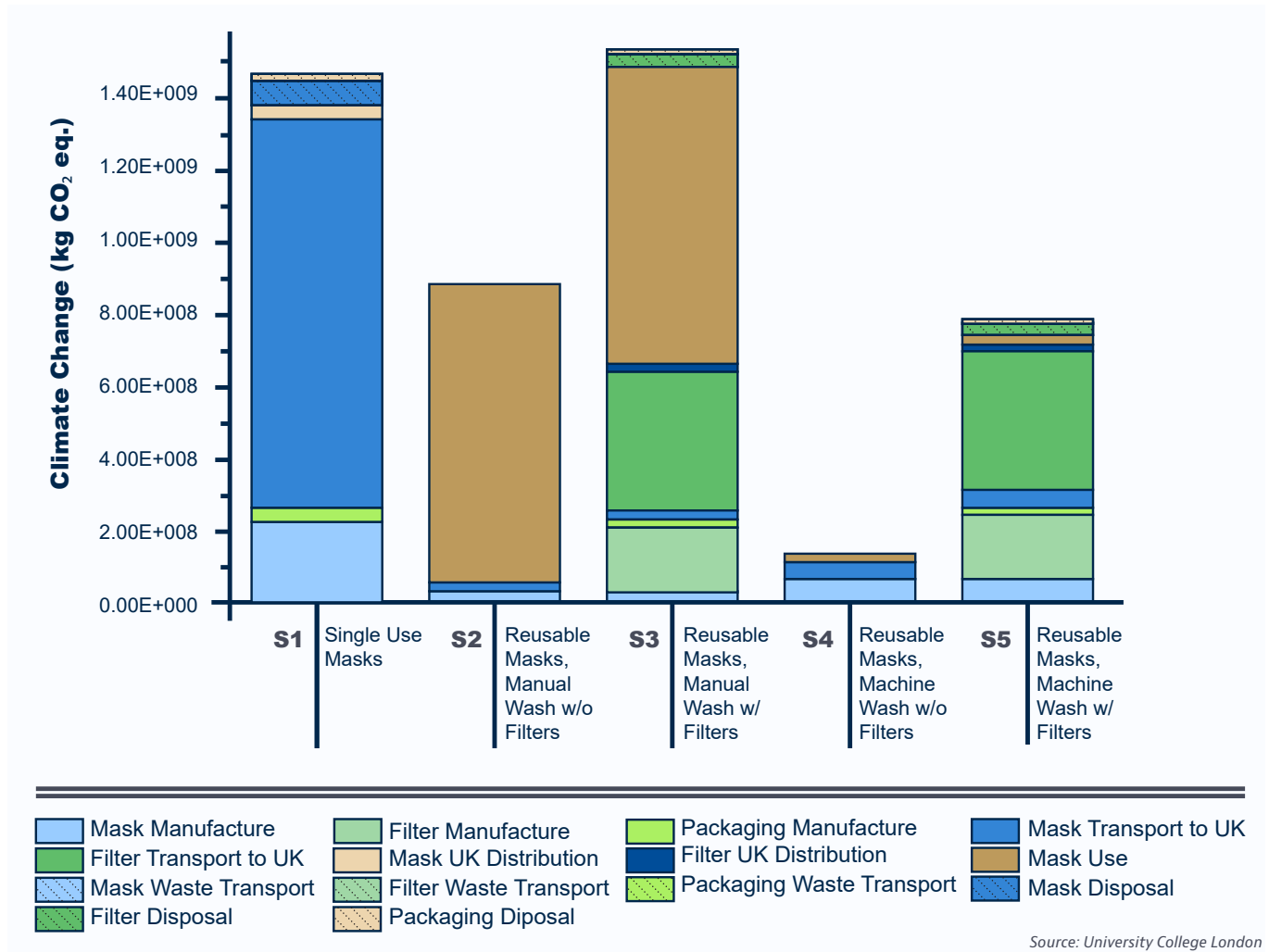
Masks are tested to meet the following standards:

1. Bacterial Filtration Efficiency in vitro (BFE) (ASTM F2101-07)
2. Breathing Resistance (Delta P)
3. Splash Resistance (ASTM F1862-07)
4. Flammability rating (Class I flame resistant)
5. Microbial Cleanliness (≤ 30 cfu/g)

14. Export volume and value of medical supplies from China between March 1 and April 30, 2020, by type: Statista GmbH - www.statista.com

15. Medical Devices: HPRA: <https://www.hpra.ie/homepage/medical-devices/covid-19-updates/regulation-of-face-masks-and-gloves>

CASE STUDY: Analysis of Face Mask Production and Consumption Factors



Source: University College London

FIGURE 2. CLIMATE CHANGE RESULTS GENERATED FOR EACH SCENARIO OF FACE MASK USE

A study at **University College London**¹⁶ (UCL) produced the following findings based on different types of face mask production. (See Figure 2)

Based on an assumed country of origin, China, and destination, the United Kingdom, the **Life Cycle Analysis** found that the bulk of carbon emissions were produced in the transportation phase of the supply chain from China-UK. However the analysis also noted that UK-based manufacturing required the importation of large amounts of raw materials,

given that the UK is neither a cotton or non-woven textile producer. Localisation of production would need to walk hand-in-hand with the utilisation of indigenous natural resources to have any comparative advantage. The study does conclude however that the use of reusable face masks is preferable to single-use face masks if the correct conditions are put in place, including; proper public health guidance on the wearing of masks, and safe washing and handling guidelines.

16. University College London Plastic Waste Innovation Hub: <https://www.plasticwastehub.org.uk/news/new-publication-on-single-use-masks>

THE PPE-WASTE CONNECTION



While we are keen to stress the importance of addressing the public health crisis in the first instance, we are also eager to highlight the environmental threat which current and future generations will encounter through our increased consumption of single-use materials. While plastic does have many beneficial qualities and uses within the healthcare sector and beyond, and is relatively cheap and flexible in application, it is also a pervasive post-consumer waste hazard.

The **Plastic Waste Innovation Hub** at University College London estimates that if every person in

the UK used a single-use face mask each day for a year it would create 66,000 tonnes of contaminated plastic waste. Extrapolating from the UCL figures, for an Irish population size, this would equate to 6,000 tonnes of contaminated plastic waste resulting from the use of single-use face masks (not including packaging material).

The health of the natural environment affects public health. The two cannot be disconnected and we must therefore be cognisant that in the addressing of one crisis we may in fact be creating a second.

WASTE MANAGEMENT IN THE HEALTHCARE SETTING

Segregation, Packaging and Storage Guidelines for Waste Management within the Health Services¹⁷ environment are determined as follows:

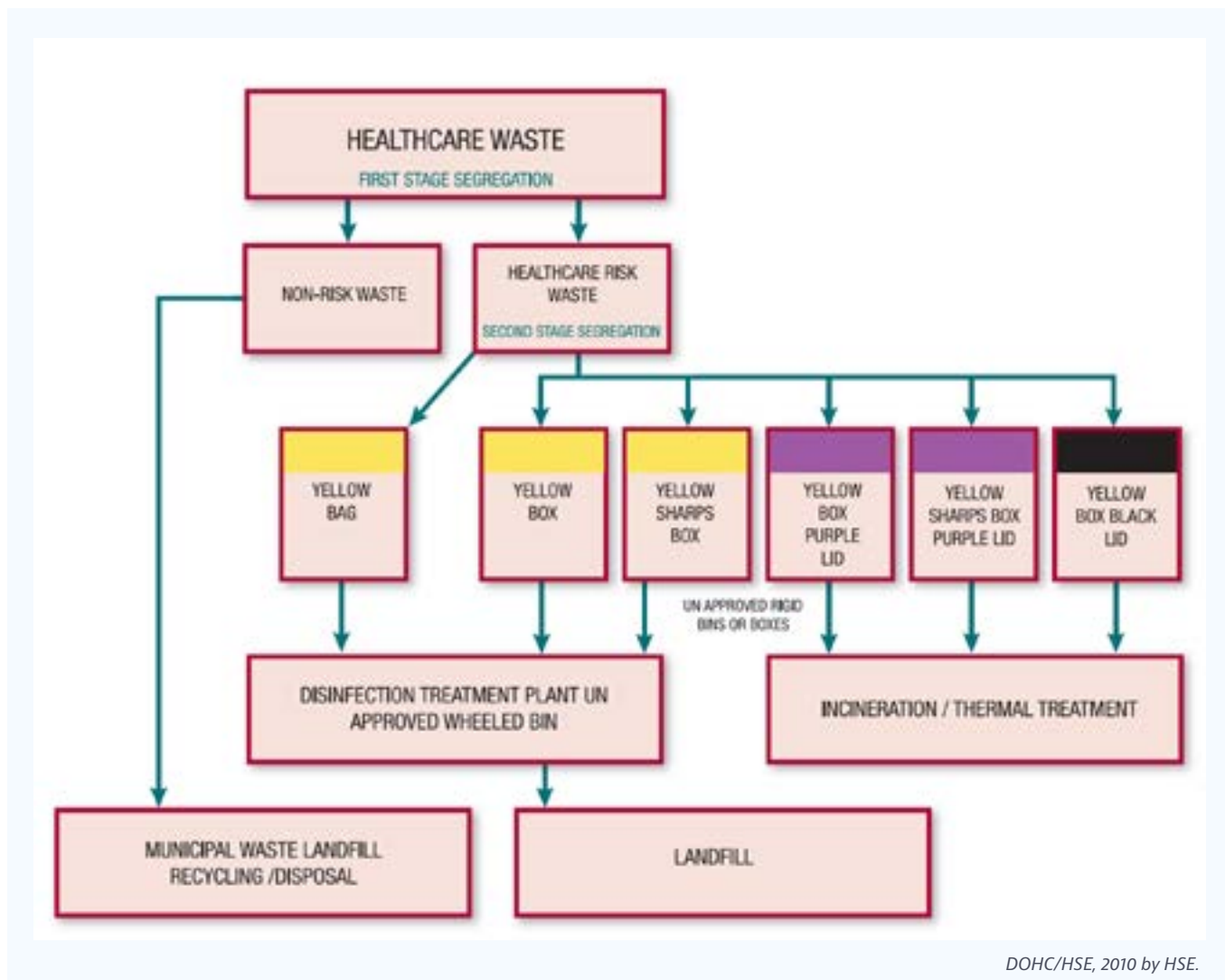


FIGURE 3. HEALTHCARE WASTE - BASIC SEGREGATION AND PACKAGING SCHEMATIC

PPE waste in the healthcare setting in Ireland is processed through four distinct management processes:

- Healthcare Risk Waste Incineration (€2,125/tonne)
- Healthcare Risk Waste Sterilisation (€935/tonne)
- General Waste Landfill (€130-€200/tonne)
- Recycling (€0-€170/tonne)

17. Health Services Executive Waste Management Handbook: <https://www.hse.ie/eng/about/who/healthbusinessservices/national-health-sustainability-office/files/hse-waste-management-handbook.pdf>



The Green Healthcare Programme¹⁸ (GHCP – www.greenhealthcare.ie) was a co-funded initiative of the Health Service Executive’s National Health Sustainability Office and the Environmental Protection Agency’s National Waste Prevention Programme (NWPP) and ran from 2009-2018. It is possible that a new programme can be initiated to focus on ways to minimise the amount of single-use materials being used in healthcare settings.

If we assume that for a healthcare setting all contaminated medical face masks go to incineration, then the burden (€2,125/tonne disposal) on the public sector and consequently the tax payer, is significant.

Incineration

The majority of waste produced by the healthcare sector is sent to incineration. However this is not the case with waste materials produced in other public sector or ancillary organisations, such as; Construction, Education and Local Authorities. The Environmental Protection Agency (EPA) reports¹⁹ that in 2018, a total of 112,367 tonnes of hazardous waste was treated at Irish waste

facilities. Ireland exported 73% (383,903 tonnes) of its hazardous waste to other EU member states and beyond. A total of 308,991 tonnes came from chemical waste, medical waste, cement kiln dust and ash from municipal waste incinerators.

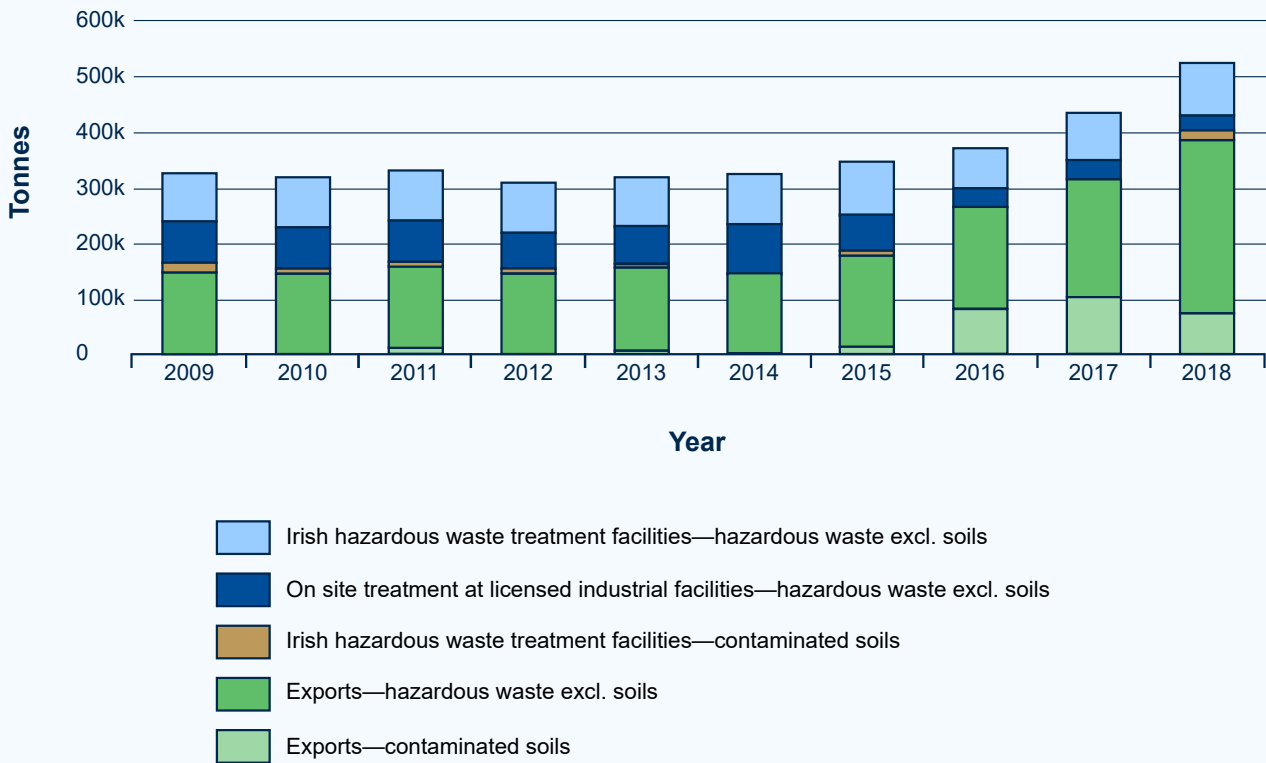
If every person in the UK used one single-use face mask each day for a year, it would create 66,000 tonnes of contaminated plastic waste, the report warns, and ten times more climate change impact than using reusable masks.

The Plastic Waste Innovation Hub
University College London

The EPA report also highlights that the Netherlands, UK, Germany, Belgium, Norway and France process 99% of Ireland’s non-soil hazardous waste exports. Interestingly, ash from municipal incineration accounts for an increase of 100,000 tonnes of waste sent to the Netherlands in 2018. At time of writing no exact figures were available for plastic waste incineration for 2020 but we can assume that as the economy returns to the ‘new normal’ we may encounter increased volumes of both municipal waste and consequently ash from incineration processes.

18. Green Healthcare: <https://www.greenhealthcare.ie/topics/risk-waste/>

19. Environmental Protection Agency (EPA): <http://www.epa.ie/nationalwastestatistics/hazardous/>



<http://www.epa.ie/ationalwastestatistics/hazardous/>

FIGURE 5: QUANTITY OF HAZARDOUS WASTE GENERATED AND TREATMENT LOCATION

The **Waste Framework Directive**²⁰, the **Landfill Directive**²¹ and the **Producer Responsibility Directive**²² governs Ireland’s targets under EU waste legislation.

The challenge for all stakeholders is to minimise the total volume of waste. This can only be achieved through:

- **Design** – redesigning systems and processes (hand sanitiser, hand-washing, occupational health measures, air flow design, building design, temperature measurement, workflow management, public space management, and social distancing)
- **Replacement** – substitution of recyclable/ biodegradable materials for single-use materials
- **Demand management** – minimising the amount of materials required at point of use

20. Waste Framework Directive: <https://ec.europa.eu/environment/waste/framework/>

21. Landfill Directive: <https://ec.europa.eu/environment/waste/framework/>

22. Producer Responsibility Directive: <https://ec.europa.eu/environment/waste/framework/>

THE CIRCULAR ECONOMY



According to the European Green Deal's Sustainable Industry²³ plan, the Commission will present a 'sustainable products' policy, which will prioritise reducing and reusing materials before recycling them. Minimum requirements will be set to prevent environmentally harmful products from being placed on the EU market. The Commission will propose measures to ensure that **all packaging in the EU is reusable or recyclable by 2030.**

New business models based on renting goods and services will help to shift consumption patterns away from single or limited use products (*not specifically applicable to PPE consumption given the nature of its application in the healthcare setting) supported by a proposal establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law).

"Every sector, every household, every business, and organisation across Ireland has a role to play in the transition to a circular economy. Through increased awareness, better-informed consumption decisions and buy-in to a shared responsibility, Ireland can become a leader in this field delivering environmental, social and economic benefits."

Minister for Communications, Climate Action and Environment Eamon Ryan TD referring to the Waste Action Plan for a Circular Economy.

Source: www.gov.ie/en/press-release/eb955-minister-ryan-launches-waste-action-plan-for-a-circular-economy/



23. European Green Deal's Sustainable Industry plan: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

The **circular economy** is an essential step towards achieving climate-neutrality by 2050, and it is also essential in achieving **sustainable development**, more **resilient communities**, and **economic competitiveness**. Indeed, the linear nature of designed obsolescence and disposal, results in overuse of precious resources, overconsumption, and waste. Across the EU only 12% of secondary materials and resources brought back into the economy. In 2017 Ireland's figure is 1.6%.²⁴

The new Circular Economy Action Plan²⁵ presents measures to:

- Make sustainable products the norm in the EU;
- Empower consumers and public buyers;
- Focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT; batteries and vehicles; packaging; plastics; textiles; construction and buildings; food; water and nutrients;
- Ensure less waste;
- Make circularity work for people, regions and cities,
- Lead global efforts on circular economy.

"... This more circular approach will ensure a cleaner and more competitive industry by reducing environmental impacts, alleviating competition for scarce resources and reducing production costs. The business case is as strong as the environmental and moral imperative.

Applying circular economy principles in all sectors and industries has potential to create 700,000 new jobs across the EU by 2030, many of which in SMEs."

A New Industrial Strategy for Europe ²⁶

How can we simultaneously address the critical urgency of the public health and climate crisis?

We must transition economically and environmentally, and plan for a **new industrial way**. The new industrial way is a multi-faceted approach to a radically different industrial future in Europe, based on ecological principles, economic competitiveness, and 'greener' industrial ecosystems. The ambition for the new industrial way is enshrined in the **European Green Deal** and the creation of circular economies and the world's first climate-neutral continent by 2050. To achieve the goals set out by the European Green Deal, industry will have to work on reducing its carbon footprint while simultaneously accelerating the transition to clean technology solutions. We must meet the twin challenge of both the Covid-19 pandemic and Climate Crisis by **building back better**.

The New Industrial Way and Personal Protective Equipment

There is not one single solution which can solve the impending environmental problem of PPE waste into the future. Instead, there are a number of transitional remedies, which rely heavily at the public sector level, on the core principles of **Green Public Procurement** and the creation of a **Circular Economy**.

24. European Green Deal's Sustainable Industry plan: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

25. First Circular Economy Action Plan: https://ec.europa.eu/environment/circular-economy/#:~:text=The%20European%20Commission%20has%20adopted,new%20agenda%20for%20sustainable%20growth.&text=It%20introduces%20legislative%20and%20non_level%20brings%20real%20adde

26. Communication from the Commission to the European Parliament

BIO-MATERIALS ECONOMY

A Bio-materials economy will work on the principal of having a benign effect on the natural world and at the same time creating new products and service innovations which will be inspired by nature.

Irish industry in collaboration with third-level research institutions can lead the way to a Bio-materials economy. Some of the investigations already underway will help remediate problems of our own creation, plastic waste as an example, while correspondingly create new innovations based on the use of natural materials.

Smart-PPE: Smart-PPE is another emerging technology which could offer some possible alternatives to the use of disposable PPE materials. Could **virus detection technology** be embedded in PPE to reduce the amount of times PPE needs to be changed? Could **virus elimination technology** be embedded in PPE to eradicate a virus or bacteria on contact?

How can we address the PPE waste issue?

We must firstly quantify the problem to understand the downstream impacts of single-use PPE consumption (eco-system damage, landfill, incineration, carbon emissions etc.), assessing the current system of raw material extraction, production, manufacturing and delivery, and attaching a cost to same. Based on an LCA/LCC analysis we will better understand the problem and by consulting the market we will begin to understand possible alternatives.

The pre-procurement phase²⁷ of the GPP process can guide the process.

- Re-use of existing stock
- Rethinking how demand can be met in a way that requires fewer or better value goods to be bought
- Surveying the market for new technologies
- Speaking to other public or private sector organisations who have adopted environmentally friendly products or services
- Determining which environmental standards, labels, certifications and legislation are relevant

(*Abbreviated from Green Procurement: Guidance for the Public Sector published by the Environmental Protection Agency in 2014-update due early 2021)

27. Green Procurement: Guidance for the Public Sector published by the Environmental Protection Agency in 2014



CONCLUSIONS

“Government on its own cannot solve climate change, or create an equitable production system. It needs the private sector, and the private sector needs the public sector.”

Mariana Mazzucato, Economist at University College London

If we do not act now an estimated 12 billion metric tons (Mt) of plastic litter will end up in landfills, incinerators and in the natural environment by 2050²⁸. A significant percentage of that litter will be attributable to PPE waste materials. This will cause unimaginable harm to ecosystems, societies, individuals, and economies. We have an opportunity today to change that trajectory.

The **European Green Deal**, as described by President van der Leyen and others will offer an opportunity for a **Just Transition** and allow policy makers to:

- **Reimagine** economic systems and processes to support innovation, invention and entrepreneurship
- **Redesign** products and services supported by robust, trusted and transparent supply chains supported by concepts such as; Life Cycle Costing and Life Cycle Analysis
- **Rebuild** systems and public infrastructure better than before to create a pan-European resilience to future shocks
- **Regenerate** industrial eco-systems to include business, a resilient society, and sustainable work and job creation opportunities, while protecting the natural environment in the process
- **Renew Reputation** by demonstrating leadership on environmental issues

28. Production, use, and fate of all plastics ever made; R. Geyer, J.R. Jambeck, K.L. Law, *Sci. Adv.*, 3 (2017), Article e10700782, 10.1126/sciadv.1700782

Innovation: There is an opportunity to scale start-up enterprises through innovation vouchers/ grants and loans to fast-track PPE alternatives, and incentivise farmers and marine-based industry to grow renewable bio-materials to reduce the impact of non-biodegradable PPE materials on the environment. The conversation must begin between all stakeholders in the process about the types of products and services we desire.

Localisation of PPE production using standard non-woven materials could be scaled up reasonably easily in Ireland but there is little advantage to be gained by on-shoring 'dirty industry'. Instead we must build sustainable manufacturing systems based on the concept of a circular economy. To do that we must reimagine products, processes and services in a more holistic way.

Product innovation could manifest as more localisation of manufacturing occurs. This may present an opportunity for manufacturers to transition from unsustainable material usage to bio-materials and better waste-stream management practices. Public sector procurement guidelines in tandem with support from state agencies could hasten this transition, both in the scaling up of indigenous industry and bio-material adoption rates.

Collaboration – governments and international organisations must work together to scale up innovative responses to the current pandemic and the climate crisis.

If we are to successfully navigate a path through crisis then we must be willing to accept that a return to business-as-usual post-Coronavirus is no longer feasible, and that the climate crisis also demands urgent action over the longer term. We must also accept that we are transitioning to a 'new normal' in so many different ways; economically, socially, technologically and environmentally. The new normal will demand that we put systems and processes in place which simultaneously protect people and the planet. This will require creative solutions and innovative thinking. It will also involve nationwide, pan-European and global collaboration.

Green Public Procurement can facilitate the discussion on how to enable a more sustainable future; a future which demands creative measures to react to near-term crisis, and a longer term vision to protect the next generation.

A sustainable future is not guaranteed but we can strive towards it. There is no better time than the present for that future to begin.

APPENDIX A: A New Industrial Strategy for Europe

“Europe’s industry has a global competitive advantage on high value-added products and services. It leads by example complying with the highest social, labour and environmental standards, allowing Europe to project its values. ... Thanks to a strong innovation capacity, it is also a world leader in green technology patents and other high tech sectors. Our single market empowers European companies of all sizes to innovate, scale-up and employ more people ...”

Brussels, 10.3.2020 COM(2020) 102 final COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A New Industrial Strategy for Europe

APPENDIX B: Circular Economy Action Plan

A SUSTAINABLE PRODUCT POLICY FRAMEWORK		LESS WASTE, MORE VALUE	
Legislative proposal for a sustainable product policy initiative	2021	Waste reduction targets for specific streams and other measures on waste prevention	2022
Legislative proposal empowering consumers in the green transition	2020	EU-wide harmonised model for separate collection of waste and labelling to facilitate separate collection	2022
Legislative and non-legislative measures establishing a new "right to repair"	2021	Methodologies to track and minimise the presence of substances of concern in recycled materials and articles made thereof	2021
Legislative proposal on substantiating green claims	2020	Harmonised information systems for the presence of substances of concern	2021
Mandatory Green Public Procurement (GPP) criteria and targets in sectoral legislation and phasing-in mandatory reporting on GPP	as of 2021	Scoping the development of further EU-wide end-of-waste and by-product criteria	2021
Review of the Industrial Emissions Directive, including the integration of circular economy practices in upcoming Best Available Techniques reference documents	as of 2021	Revision of the rules on waste shipments	2021
Launch of an industry-led industrial symbiosis reporting and certification system	2022	MAKING THE CIRCULAR ECONOMY WORK FOR PEOPLE, REGIONS AND CITIES	
KEY PRODUCT VALUE CHAINS		Supporting the circular economy transition through the Skills Agenda, the forthcoming Action Plan for Social Economy, the Pact for Skills and the European Social Fund Plus,	as of 2020
Circular Electronics Initiative, common charger solution, and reward systems to return old devices	2020/2021	Supporting the circular economy transition through Cohesion policy funds, the Just Transition Mechanism and urban initiatives	as of 2020
Review of the Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment and guidance to clarify its links with REACH and Ecodesign requirements	2021	CROSSCUTTING ACTIONS	
Proposal for a new regulatory framework for batteries	2020	Improving measurement, modelling and policy tools to capture synergies between the circular economy and climate change mitigation and adaptation at EU and national level	as of 2020
Review of the rules on end-of-life vehicles	2021	Regulatory framework for the certification of carbon removals	2023
Review of the rules on proper treatment of waste oils	2022	Reflecting circular economy objectives in the revision of the guidelines on state aid in the field of environment and energy	2021
Review to reinforce the essential requirements for packaging and reduce (over)packaging and packaging waste	2021	Mainstreaming circular economy objectives in the context of the rules on non-financial reporting, and initiatives on sustainable corporate governance and on environmental accounting	2020/2021
Mandatory requirements on recycled plastic content and plastic waste reduction measures for key products such as packaging, construction materials and vehicles	2021/2022	LEADING EFFORTS AT GLOBAL LEVEL	
Restriction of intentionally added microplastics and measures on unintentional release of microplastics	2021	Leading efforts towards reaching a global agreement on plastics	as of 2020
Policy framework for bio-based plastics and biodegradable or compostable plastics	2021	Proposing a Global Circular Economy Alliance, and initiating discussions on an international agreement on the management of natural resources	as of 2021
EU Strategy for Textiles	2021	Mainstreaming circular economy objectives in free trade agreements, in bilateral, regional and multilateral processes and agreements, and in EU external policy funding instruments	as of 2020
Strategy for a Sustainable Built Environment	2021	MONITORING THE PROGRESS	
Initiative to substitute single-use packaging, tableware and cutlery by reusable products in food services	2021	Updating the Circular Economy Monitoring Framework to reflect new policy priorities and develop further indicators on resource use, including consumption and material footprints	2021

https://ec.europa.eu/environment/circular-economy/pdf/implementation_tracking_table.pdf

APPENDIX C: Definitions of alternative plastics

Natural bio-based polymers

These polymers are synthesised by living organisms, essentially in the form in which they are finally used. Examples of naturally produced bio-based polymers include;

- polysaccharides
- cellulose / starch
- proteins
- bacterial polyhydroxyalkanoates

Synthetic bio-based polymers

Polymers whose monomers derive from renewable resources but which require a chemical transformation for conversion to a polymer.

Degradable

A plastic can be described as degradable when it undergoes a significant change in initial properties due to chemical cleavage of the macromolecules forming a polymeric item regardless of the mechanism of chain cleavage i.e. there is no requirement for the plastics to degrade due to the action of naturally occurring micro-organisms. Examples of degradable plastics include, oxo-degradables and UV-degradables which break down when exposed to oxygen or light and are primarily oil-based.

Biodegradable

Biodegradability can be described as "the degradation of a polymeric item due, at least in part, to cell-mediated phenomena. As a result of the action of micro-organisms the material is ultimately converted to water, carbon dioxide,

biomass and possibly methane." The ability of a polymer to biodegrade is independent of the origin of its raw material. Instead it strongly depends upon the structure of the polymer. For example, whilst some bio-based plastics may be biodegradable (poly-hydroxyalkanoates) others are not (poly-ethylene derived from sugar cane).

Compostable

For a plastic to be considered compostable it must meet the following criteria:

- Biodegrade; break down into carbon dioxide, water and biomass. 90% of the organic materials are converted into CO₂ within 6 months.
- Disintegrate; After 3 months' composting and subsequent sifting through a 2mm sieve, no more than 10% residue may remain
- Eco-toxicity: the biodegradation does not produce any toxic material and the compost can support plant growth.

A plastic therefore may be degradable but not biodegradable or it may be biodegradable but not compostable (i.e. it breaks down too slowly or leaves toxic residues).

Source: <https://www.bpf.co.uk/plastipedia/polymers/polymer-bio-based-degradables.aspx>

APPENDIX D: Statement on Circular Economy Action Plan

“To achieve climate-neutrality by 2050, to preserve our natural environment, and to strengthen our economic competitiveness, requires a fully circular economy. Today, our economy is still mostly linear, with only 12% of secondary materials and resources being brought back into the economy. Many products break down too easily, cannot be reused, repaired or recycled, or are made for single use only. There is a huge potential to be exploited both for businesses and consumers. With today's plan we launch action to transform the way products are made and empower consumers to make sustainable choices for their own benefit and that of the environment.”

Executive Vice-President for the European Green Deal, Frans Timmermans, March 11th, 2020 referring to the Circular Economy Action Plan - one of the main building blocks of the **European Green Deal**

https://ec.europa.eu/commission/presscorner/detail/en/IP_20_420

REFERENCES

1. The European Green Deal:
https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
2. Circular Economy Action Plan:
https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf
3. Speech by Ursula van der Leyen to the European Parliament:
https://ec.europa.eu/commission/presscorner/detail/en/speech_20_877
4. Trade in Healthcare Products, European Commission on Trade, 2020:
https://trade.ec.europa.eu/doclib/docs/2020/june/tradoc_158776.pdf
5. Next Generation EU:
https://ec.europa.eu/ireland/news/europe-s-moment-repair-and-prepare-for-the-next-generation_en
6. EU4Health for a healthier and safer EU:
https://ec.europa.eu/eip/ageing/news/eu4health-healthier-and-safer-eu_en
7. Emergency Support Instrument:
https://ec.europa.eu/echo/what/civil-protection/emergency-support-instrument_en
8. EU Budget for the Future:
https://ec.europa.eu/echo/files/aid/countries/factsheets/thematic/2020_rescEU_MFF_en.pdf
9. Crisis Preparedness and Response: Joint Procurement Agreement:
https://ec.europa.eu/health/preparedness_response/joint_procurement_en
10. Green Procurement: https://ec.europa.eu/environment/gpp/index_en.htm
11. Green Procurement: Guidance for the Public Sector published by the Environmental Protection Agency in 2014:
<https://www.epa.ie/pubs/reports/green%20business/GreenPublicProcurementfinalwebv2.pdf>
12. Trade in Healthcare Products, European Commission on Trade, 2020 – World Trade Organization:
https://trade.ec.europa.eu/doclib/docs/2020/june/tradoc_158776.pdf
13. Advice on the use of masks in the context of COVID-19 - World Health Organisation
([https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-\(2019-ncov\)-outbr-eak](https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak))
14. Trade in Medical Goods in the context of tackling COVID-19, World Trade Organization April 2020:
https://www.wto.org/english/news_e/news20_e/rese_03apr20_e.pdf
15. Medical Devices: COVID-19 Update, Health Products Regulatory Authority:
<https://www.hpra.ie/homepage/medical-devices/covid-19-updates/regulation-of-face-masks-and-gloves>
16. University College London Plastic Waste Innovation Hub:
<https://www.plasticwastehub.org.uk/news/new-publication-on-single-use-masks>
17. Health Services Executive Waste Management Handbook:
<https://www.hse.ie/eng/about/who/healthbusinessservices/national-health-sustainability-office/files/hse-waste-management-handbook.pdf>

18. Green Healthcare: <https://www.greenhealthcare.ie/topics/risk-waste/>
19. Environmental Protection Agency (EPA): <http://www.epa.ie/nationalwastestatistics/hazardous/>
20. Waste Framework Directive: <https://ec.europa.eu/environment/waste/framework/>
21. Landfill Directive: <https://ec.europa.eu/environment/waste/framework/>
22. Producer Responsibility Directive: <https://ec.europa.eu/environment/waste/framework/>
23. European Green Deal's Sustainable Industry plan: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
24. Statistics on national recycling rates - Eurostat: <https://ec.europa.eu/eurostat/tgm/web/table/description.jsp>
25. First Circular Economy Action Plan: (<https://ec.europa.eu/environment/circular-economy/#:~:text=The%20European%20Commission%20has%20adopted,new%20agenda%20for%20sustainable%20growth.&text=It%20introduces%20legislative%20and%20non,level%20brings%20real%20added%20value.>)
26. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: Brussels, 10.3.2020 COM(2020) 102 final
27. Green Procurement: Guidance for the Public Sector published by the Environmental Protection Agency in 2014
28. Production, use, and fate of all plastics ever made; R. Geyer, J.R. Jambeck, K.L. Law, Sci. Adv., 3 (2017), Article e10700782, 10.1126/sciadv.1700782

Additional Reading:

- <https://eithealth.eu/covid-19-rapid-response/virushield/>
- <https://bioplasticsnews.com/2019/01/21/pha-bioplastics-2019/>
- <https://d2zly2hmrfvxc0.cloudfront.net/Covid19-Masks-Plastic-Waste-Policy-Briefing.final.pdf?mtime=20200424170934>
- https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=cei_srm030&plugin=1
- <https://www.bbi-europe.eu/projects>
- <https://ec.europa.eu/eurostat/tgm/web/table/description.jsp>
- <https://www.p4sb.eu/about-p4sb.html>)



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