



**OUR ACTIONS FOR A RESOURCE-EFFICIENT FUTURE:
FOLLOWING UP G7 PROGRESS ON
TOYAMA FRAMEWORK ON MATERIAL CYCLES AND
5-YEAR BOLOGNA ROADMAP**



Acknowledgements

This synthesis report has been produced as a follow-up activity of the G7 Alliance on Resource Efficiency on both the Toyama Framework on Material Cycles (2016) and the 5-year Bologna Roadmap (2017) adopted at the G7 Environment Ministers' Meetings, conducted under an initiative of the Ministry of the Environment, Japan. Reports on actions by the G7 described in this document have been provided by the following alliance members:

Canada: Environment and Climate Change Canada

France: Ministry of the Ecological and Inclusive Transition

Germany: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Italy: Ministry of Environment, Land and Sea

Japan: Ministry of the Environment

UK: Department for Environment, Food & Rural Affairs

US: Environment Protection Agency

EU: DG Environment, European Commission



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The Alliance is grateful to the Ministry of the Environment, Japan for providing follow-up opportunities and to the Institute for Global Environmental Strategies for compiling a significant series and making it into an informative catalogue of actions carried out by the Alliance. The Alliance hopes that this report will be helpful to facilitate understanding on the actions taken by alliance members and that it will also serve as a useful reference for all countries and stakeholders who would like to promote actions for RE/CE/3R/SMM as well as the wider international community.

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Disclaimer: The report does not necessarily provide exhaustive documentation of all activities by the G7 Alliance on Resource Efficiency; rather it documents their on-going efforts and best practices on the topics set out in the Toyama Framework on Material Cycles and the 5-year Bologna Roadmap at the time when compilation work was conducted between June 2018 and March 2019.

Suggested citation:

Ministry of the Environment, Japan(2019) Our Actions for a resource-efficient future: Following up G7 Progress on Toyama Framework on Material Cycles and 5-year Bologna Roadmap, A synthesis report as a follow-up activity of the G7 Alliance on Resource Efficiency, edited and compiled by Aoki-Suzuki, C., Miyazawa, I., Kato, M., and Fushimi, E. of the Institute for Global Environmental Strategies (IGES).

Our Actions for a resource-efficient future: Following up G7 Progress on Toyama Framework on Material Cycles and 5-year Bologna Roadmap

A synthesis report as a follow-up activity of the G7 Alliance on Resource Efficiency on both the Toyama Framework on Material Cycles (2016) and the 5-year Bologna Roadmap (2017) adopted at the G7 Environment Ministers' Meetings

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Acronyms and Abbreviations

CE	Circular Economy
EC	European Commission
EPR	Extended Producer Responsibility
EPA	US Environmental Protection Agency
EU	European Union
GSA	US General Services Administration
GDP	Gross Domestic Product
GPP	Green Public Procurement
G7	Group of Seven
G20	Group of Twenty
IRP	International Resource Panel
LCA	Life Cycle Assessment
OECD	Organisation for Economic Cooperation and Development
RE	Resource Efficiency
RRRDR	Remanufacture, Refurbishment, Repair and Direct Reuse
SDGs	Sustainable Development Goals
SMM	Sustainable Materials Management
3R	Reduce, Reuse, Recycle

Executive Summary

Resource use is essential for a decent quality of life and to ensure that basic human needs are met. On the other hand, continuous growth in resource extraction and current unsustainable consumption and production patterns have generated negative environmental pressure on our planet. Considering the capacity of our planet and planetary boundaries, we need to take urgent action to avoid further unsustainable extraction, and develop strategies how our society can achieve sustainable natural resource management with ensuring human well-being. In this regards, the international community has begun to take action through resource efficiency (RE), circular economy (CE), 3Rs (Reduce, Reuse and Recycle) and sustainable material management (SMM).

The G7 has been successful in consolidating its concerted actions through the adoption of several documents and initiatives such as the Toyama Framework on Material Cycles at the G7 Toyama Environment Ministers' Meeting in 2016 under Japan's presidency, the 5-year Bologna Roadmap at the G7 Bologna Environment Ministers' Meeting in 2017 under Italy's presidency and the G7 Plastic Innovation Challenges at the G7 Halifax Environment, Oceans and Energy Ministers Meeting in 2018 under the Canadian presidency. The G7 has invited the International Resource Panel (IRP) and the Organisation for Economic Co-operation and Development (OECD) to provide their assessment and guidance to facilitate policy actions to feed into international discussion on and implementation of RE/CE/3R/SMM policies.

The G7 is one of the leading forums to discuss and share best practices of RE/CE/3R/SMM for materialising concrete and concerted action, not only at the G7 level but also on a global scale. In this regard, the G7 Alliance on Resource Efficiency was established at the G7 Summit Schloss Elmau in 2015 as a forum to share knowledge and create information networks on emerging topics for RE/CE/3R/SMM. As of May 2019, 15 workshops have been held by the alliance members on a voluntary, nonbinding basis to discuss emerging and significant topics for RE/CE/3R/SMM to exchange and promote best practices and foster innovation together with businesses and other stakeholders, including from the public sector, research institutions, academia, consumers and civil society. In addition, the Alliance shared the view on the importance of follow-up activities to look at the status of the G7's actions and good examples in policymaking, implementation and monitoring, and to keep the momentum for our sustainable future.

This synthesis report compiles various efforts on RE/CE/3R/SMM improvement carried out by the members of the G7 Alliance on Resource Efficiency (hereafter members or the alliance members). This is one of the follow-up activities for the alliance on the Toyama Framework on Material Cycles and the 5-year Bologna Roadmap. Members of the G7 Alliance have implemented various significant efforts and best practices for policy areas set out in the Toyama Framework on Material Cycles and the 5-year Bologna Roadmap, both of which emphasise the importance of periodical follow-up on the implementation of RE/CE/3R/SMM and sharing good practices among members as well as globally with non-G7 members. The results listed in this report are non-exhaustive but represent recent actions and some good practices by the members to achieve a resource-efficient future.

The alliance members have their own strategies on waste, resource efficiency, circular economy, 3Rs and SMM. Each of these strategies has a different focus depending on the context of the member, but in general, members are promoting a RE/CE/3R/SMM approach and have set priority areas in which to work, such as food, plastics or metals. Some strategies include indicators and targets, for example on resource productivity, material flow and recycling rate. Several members have promoted inter-ministerial / cross-cutting / sector-wide discussion by establishing commissions or meetings/committees, aiming at effective implementation of RE/CE/3R/SMM actions.

Members have also made efforts in specific major policy areas set out in the Toyama Framework and the Bologna Roadmap such as Plastics, Food waste, Green Public Procurement (GPP), Actions for final consumers and citizens, Lifetime extension product policies, Remanufacture, Refurbishment, Repair and Direct Reuse (RRRDR), Extended Producer Responsibility (EPR), Industrial symbiosis and Research / Economic Analysis.

Many members have developed national strategies to address plastic waste from the perspective of RE/CE/3R/SMM and have implemented various policy measures including restriction of a certain plastics such as microbeads, and refund schemes. Initiatives, coalitions and collaboration of/with the private sector and international cooperation have also been conducted to address plastic waste issues. Initiatives, coalitions and

collaboration of/with the private sector and international cooperation have also been conducted to address plastic waste issues. Members have also made efforts in measuring food loss and waste, concluded agreements/commitments with the private sector, conducted awareness-raising on food loss through webinars and campaigns as well as implementing laws on food waste recycling, for effective reutilisation as feed or in agriculture. GPP from a RE/CE/3R/SMM perspective which reflects procurement standards is conducted by some members to promote the use of resource efficient products. Educational approaches, campaigns, reconsideration to green claims, and encouraging reuse and repair have been applied to facilitate a lifestyle transition for consumers and citizens. Product lifetime extension as well as RRRDR have been discussed as an opportunity to promote RE/CE/3R/SMM in workshops held by the Alliance, and unique initiatives and some policy approaches in this area can be found in this report. EPR schemes have been widely applied by all members in the form of legislation or programmes / projects as major policy tools for RE/CE/3R/SMM. Some members are currently trying to extend their scope to products that have not been covered thus far. Industrial symbiosis is also promoted by members through various measures such as facilitating business networks, knowledge-sharing, and developing infrastructures. There are also members who have conducted economic analysis as well as promoting research for RE/CE/3R/SMM at the national level.

Recently, there have been several eye-opening, concrete actions by multiple actors such as the private sector, cities and local governments in the G7 as well as governmental supporting measures for these actors. Financing is one of the major approaches to support the private sector and local governments. Financing through funds, programmes, foundations and governmental organisations is quite common among members. Coalitions, networking and public private partnerships developed both by governments or private sector

initiatives to promote RE/CE/3R/SMM are also increasing. Some unique initiatives on specific topics such as paper, textiles and plastics at the national or regional level can be found. There are cases where cities and local governments in member countries have developed RE/CE/3R/SMM systems. These include zero-waste strategies, specific projects on food and buildings, creating alliances and developing waste-to-energy systems using residual biomass. Giving awards for best practices to multiple actors is also a popular approach among members.

Alliance members are also active in extending efforts to developing and emerging countries through international and regional cooperation. Regional forums and partnerships have been established to share knowledge and carry out dialogues, and there has been promotion of programmes and initiatives on issues such as waste management and plastics, at the regional or national level.

The G7 Environment Ministers reaffirmed their commitment to implement the Toyama Framework on Material Cycles and the 5-year Bologna Roadmap as frameworks on resource efficiency and welcomed the progress made by the G7 members, including this follow-up activity, in the communiqué at the G7 Environment Ministers' Meeting in Metz, France in May 2019. In this way, actions and concerted efforts by members of G7 Alliance on Resource Efficiency will continue to be further developed and elaborated. The alliance also hopes that this follow-up report will contribute to facilitating global, regional and national discussion for RE/CE/3R/SMM, providing informative references to a wide range of stakeholders not only in the G7 but also in non-G7 countries.



1. Introduction

Resource use is essential for a decent quality of life and to ensure our basic human needs are met. On the other hand, continuous growth in resource extraction and the current unsustainable consumption and production patterns have generated negative environmental pressure on our planet. The Global Material Resources Outlook to 2060 by the Organisation for Economic Co-operation and Development (OECD) projects a doubling of global primary materials use between today and 2060 under a business-as-usual scenario.¹ The International Resource Panel (IRP)'s Global Resource Outlook 2019 (GRO2019) shows that over the past five decades since 1970, global material extraction has tripled and will continue to grow to 190 billion tons and over 18 tons per capita by 2060 in the absence of urgent and concerted action.² The IRP also estimates in the GRO2019 that "the extraction and processing of materials, fuels and food make up about half of total global greenhouse gas emissions (disregarding climate impacts related to land use) and more than 90 per cent of biodiversity loss and water stress".² Considering the capacity of our planet and planetary boundaries, we need to take urgent action to address how to avoid unsustainable resource use, and develop a strategy to achieve the decoupling of economic development/human well-being from resource use and associated environmental impacts. The international community has discussed how our society can improve sustainable natural resource management and has begun to take action through resource efficiency (RE), circular economy (CE), 3Rs (Reduce, Reuse and Recycle) and sustainable material management (SMM). RE/CE/3Rs/SMM are key to achieving the Sustainable Development Goals and thus implementing the sustainable future envisaged by the 2030 Agenda.

RE/CE/3R/SMM policy development for achieving international environmental agreements

RE/CE/3R/SMM are becoming catalysts for achieving international environmental agreements. The recently adopted resolution on 'Innovative pathways to achieve sustainable consumption and production' by the fourth session of the UN Environment Assembly (UNEA4) has underlined the importance of advancing sustainable consumption and production patterns, including, but not limited to, through circular economy and other sustainable economic models and the implementation of the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns. It also recognised the variety of policies that countries implement to move toward sustainable consumption and production, such as resource efficiency, circular economy, sustainable materials management, and 3Rs. It has also underlined the important role of business and the financial sector in supporting Member States in implementing approaches to achieve sustainable consumption and production in all its forms including but not

limited to circular economy and other sustainable economic models, and invited the business and financial sector to consider using lifecycle assessment for the goods and services they produce and provide.

RE/CE/3R/SMM support a number of areas in the 2030 Agenda for Sustainable Development, including Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation and Infrastructure) and Goal 12 (Responsible Consumption and Production). RE/CE/3R/SMM have also been recognised as crucial strategies to tackle global environmental challenges, including climate change and achieving the Paris Agreement.² An elaborated policy package on RE/CE/3R/SMM, containing both voluntary and regulatory approaches, could help address challenges for sustainable development. The International Resource Panel (IRP) report "Resource Efficiency: Potential and Economic Implications", requested by the G7, states that there is substantial potential to achieve economically attractive resource efficiency, providing win-win outcomes that reduce environmental pressures while increasing economic growth; and that the stronger economic growth associated with resource efficiency policies more than offsets the near-term economic costs of ambitious climate action.³ The latest IRP report 'Global Resources Outlook 2019' (GRO2019) also provides new modelling results which show that well-designed and concerted policy packages can deliver substantial social and environmental benefits when environmental damage is addressed, while also supporting economic growth and human well-being.²

G7 frameworks and concerted efforts on RE/CE/3R/SMM

The G7 Alliance on Resource Efficiency is one of the leading forums to discuss RE/CE/3R/SMM and share best practices for materialising concrete and concerted action, not only at the G7 level but also on a global scale.

The G7 Alliance on Resource Efficiency was established at the G7 Summit Schloss Elmau in 2015 as a forum to share knowledge and create information networks. The Alliance organised several workshops between September 2016 and March 2019 on front-line, innovative topics (Box 1). In addition, the G7 has been successful in consolidating its concerted efforts through the adoption of several documents and initiatives such as Toyama Framework on Material Cycles at the G7 Toyama Environment Ministers' Meeting in 2016 under Japan's presidency, the 5-year Bologna Roadmap at the G7 Bologna Environment Ministers' Meeting in 2017 under Italy's presidency and the G7 Plastic Innovation Challenges at the G7 Halifax Environment, Oceans and Energy Ministers Meeting in 2018 under the Canadian presidency. Furthermore, the G7 has made efforts to develop a consolidated scientific, analytic and policy base by inviting IRP and OECD to provide assessments and guidance (Box 2).

About this follow-up action for the G7 Alliance on Resource Efficiency

The Alliance recognises the importance of sharing best practices both within and outside the G7. In addition, the Alliance shared the view on the importance of follow-up activities to look at the status of G7's progress and good examples in policymaking, implementation and monitoring, and to keep the momentum to further promote various concrete policy actions to ensure our sustainable future.

In the Toyama Framework on Material Cycles, the Alliance discussed ways to "continue to share progress, challenges and lessons learned on implementation of the Framework, through workshops and other fora" for part of 3-2 Global Efforts of Goal 3: Steady and Transparent Follow-Up Process in the framework.

The Alliance also states in the 5-year Bologna Roadmap that "we will review progress periodically on the implementation of the actions under the roadmap and the Toyama Framework through workshops and other fora in conjunction with the G7 Alliance on Resource Efficiency meetings".

In this regard, the Alliance has cooperated to develop, under Japan's leadership, this synthesis report on the Alliance's activities related to RE/CE/3R/SMM, compiled from data gathered between June 2018 and March 2019. The report describes some examples of recent and innovative initiatives taken by the G7 and their stakeholders, and presents current actions to achieve a sustainable and circular economy.

Box 1. G7 Alliance on Resource Efficiency: A Report from Workshops

The G7 Alliance on Resource Efficiency, established at the G7 Summit Schloss Elmau in 2015, is a forum to exchange and promote best practices and foster innovation together with business and other stakeholders, including from the public sector, research institutions, academia, consumers and civil society, on a voluntary, nonbinding basis. Organising workshops is the main approach to achieve the above purpose. As of May 2019, 15 workshops were held as follows:



Sep-Oct 2015	Berlin, Germany	Role of Multilateral Cooperation
Oct 2015	Birmingham, UK	Industrial Symbiosis https://www.international-synergies.com/projects/g7-workshop-on-industrial-symbiosis/
Nov 2015	Berlin, Germany	Innovative Biobased Products https://www.bmel.de/EN/Agriculture/RenewableResources/_Texte/G7-Ressourceneffizienz.html?nn=313228
Feb 2016	Yokohama, Japan	International Cooperation https://www.iges.or.jp/en/scp/20160222.html
Mar 2016	Washington, DC, USA	Supply Chain Management https://www.epa.gov/smm/g7-alliance-resource-efficiency-us-hosted-workshop-use-life-cycle-concepts-supply-chain
Dec 2016	Tokyo, Japan	Resource Efficiency and a Low-Carbon Society: Identifying Opportunities and Implications https://www.env.go.jp/en/headline/2294.html https://www.iges.or.jp/en/scp/20161213.html
		International Resource Recycling https://www.meti.go.jp/english/press/2016/1117_03.html
Feb 2017	Brussels, Belgium (EU)	Promoting Remanufacturing, Refurbishment, Repair, and Direct Reuse (RRRDR) http://ec.europa.eu/environment/international_issues/relations_g20_events_en.htm
Mar 2017	Rome, Italy	G7 Workshop on "Environmentally Harmful Subsidies and Environmental Fiscal Reform"
Apr 2017	Rome, Italy	G7 Environment Workshop on Marine Litter
Jun 2017	Berlin, Germany	Sustainable Consumption and Production Patterns in the context of 2030 Agenda implementation
Mar 2018	Brussels, Belgium (EU)	G7 Plastics Workshop in the context of 2030 Agenda implementation and towards G7 collaborative activities http://ec.europa.eu/environment/international_issues/relations_g20_events_en.htm
Jun 2018	Montreal, Canada	Promoting Value Retention Process (VRP) and RRRDR http://ec.europa.eu/environment/international_issues/relations_g20_events_en.htm
Jun 2018	Cambridge, Massachusetts, USA	International Approaches to Reducing Food Loss and Waste (as a one of sessions in the U.S. Food Waste Summit*) https://www.chlpi.org/food-law-and-policy/major-events/u-s-food-waste-summit-2018/http://ec.europa.eu/environment/international_issues/relations_g20_events_en.htm
Mar 2019	Paris, France	Tools making value chains more circular and resource efficient - Voluntary agreements, standardisation & non-financial reporting http://ec.europa.eu/environment/international_issues/relations_g20_events_en.htm

a: Hosted by Harvard University Food Law and Policy Clinic and ReFED

Box 2. Collaboration with IRP and OECD- inviting assessment and guidance

The G7 Alliance has collaborated with leading entities from the scientific and analytics communities on resource efficiency, including the International Resource Panel (IRP) and the Organisation for Economic Cooperation and Development (OECD).

IRP was established in 2007 as an independent scientific panel on decoupling, hosted by UNEP. IRP has published several assessment reports on resource efficiency, decoupling, circular economy and material flow. Recently IRP published its flagship report “Global Resource Outlook 2019” at the 4th United Nations Environment Assembly (UNEA4) and this was welcomed by the member states. The report shows and projects the impacts associated with resource use. IRP has also developed an international database on material flow indicators, such as domestic extraction, domestic material consumption and material footprint.

OECD has a long history working on integrated waste management and resource productivity. It has carried out advanced work on policy development for waste and the circular economy, sustainable material management and resource productivity. OECD has also taken an active role in developing methodologies on material flow analysis / accounting which form the base for material flow indicators, including resource productivity. OECD implemented the RE-CIRCLE project on the circular economy, and in 2018, it published the “Global Material Resources Outlook to 2060” based on its unique knowledge base on economic modelling.

The G7 Alliance has invited both the above organisations to develop assessment reports or guidance on emerging topics to feed into facilitating international discussion on and implementation of RE/CE/3R/SMM policies.

Invitation to IRP:

- Resource Efficiency: Potential and Economic Implications (UNEP-IRP, 2017)³



This report was developed based on a request from the German Presidency of G7 (2015) whereby the summary was released late in 2016 and the full report early in 2017. In the report, IRP provides five key messages:

1. Substantial increases in resource efficiency are essential to meet the Sustainable Development Goals (SDGs) – enabling development while protecting the environment
2. Improving resource efficiency is indispensable for meeting climate change targets cost effectively
3. Resource efficiency can contribute to economic growth and job creation
4. There are substantial areas of opportunity for greater resource efficiency
5. Increased resource efficiency is practically attainable

- Potential GHG Emissions Reductions of Resource-Efficient Policies for the Purpose of Seeking Co-Benefits

This report, which was developed based on the request from the G7 Italian presidency, identifies resource-efficient measures in terms of their potential to reduce GHG emissions. Some preliminary results of the IRP analysis relevant to this work were presented in May 2019 at the G7 Environment Ministers’ Meeting. The report will officially launched by the end of 2019.

Invitation to OECD:

- Policy Guidance on Resource Efficiency (OECD, 2016)⁴

This guidance was also developed based on the request from the German Presidency of G7 (2015). In the guidance, OECD provides key message:

1. Resource efficiency policies should target the entire life-cycle of products
2. National policies should put more emphasis on aligning sectoral policies in diverse areas like innovation, investment, trade, education and skills development with resource efficiency objectives

The guidance also recommends the following points for resource efficiency improvement: integration of resource efficiency considerations in Global Value Chains; addressing trade and investment-related obstacles to resource efficiency in supply chains; harmonisation in the growing field of environmental labelling and information schemes; and closing the information gaps related to material flows and resource efficiency.

2. National and Regional Policies & Strategies

2.1. Policymaking in progress with increased number of integrated strategies

Development of national and regional strategies is one of the key approaches to promote RE/CE/3R/SMM. The members of the G7 Alliance on Resource Efficiency (hereafter, members or the alliance members) have their own strategies on waste, resource efficiency, circular economy, 3Rs and SMM. Each of these strategies has a different focus depending on the context of the member country, but in general, members are promoting an RE/CE/3R/SMM approach and have set priority areas in which to work, such as food, plastics or metals. Some strategies include indicators and targets, for example on resource productivity, material flow and recycling rate.

- **Canada: Canada-wide Zero Plastic Waste Strategy** – in November 2018, the federal, provincial and territorial governments adopted a strategy that outlines Canada’s vision for plastics in a circular economy and the main areas of policy intervention and action.⁵ An action plan will be developed by June 2019 to implement the Canada-wide Zero Plastic Waste Strategy.

- **France: France published its Roadmap for the Circular Economy** (on 23 April 2018). It presents a structuring package that will allow all actors to “enter the Loop”.⁶ Other policies that aim at generating co-benefits to advance the circular economy include: **Energy Transition for Green Growth Act (June 2018)**; CE is an integral part of the climate plan; and industrial policy that uses the circular economy to improve the competitiveness of businesses, generate new innovations and create new activities.⁷



- **Germany: German Resource Efficiency Programme II – Programme for the sustainable use and conservation of natural resources (ProgRess)**⁸ is a programme for the sustainable use and conservation of natural resources. It fits into the broader National Sustainable Development Strategy of 2002 that includes a strategy on the sustainable use of raw materials and sets a target to double the resource productivity of the German economy by 2020 relative to 1994. ProgRess looks at resource efficiency gains in the use of abiotic and biotic resources along the entire value chain.⁹ In addition, **Closed Cycle Management Act in 1996, which was updated in 2012**, aims at improving the contribution of waste management to environmental and climate protection as well as increasing resource efficiency through strengthening waste prevention and recycling.¹⁰

- **Italy:** On 2 February 2016, the so-called “**Collegato Ambientale**” (Environmental Bill annexed to the financial law of 2014, approved as law on green economy and resource efficiency in December 2015) came into force. The Collegato represents a first comprehensive step towards the integration of many environmental-related issues in the economy in order to promote a green and low-carbon society. Parallel to the process leading to the National Strategy for Sustainable Development (adopted by the Italian Parliament in May 2018), Italy adopted in 2017 the document “**Towards a Model of Circular Economy for Italy - Overview and Strategic Framework**”,¹¹ that provides the general perspective of the Italian Government on circular economy, resource efficiency, sustainable material management, also with regard to their interaction with a low-emission economy. In addition, Italy financed an IRP study to fully investigate the contributions of resource efficiency to climate change mitigation from different product groups (e.g., buildings and construction, vehicles and transport). This will help to both implement the Bologna Roadmap as well as to formulate integrated RE/CC policies at national and global level.

- **Japan: The Fundamental Plan for Establishing a Sound Material-Cycle Society (2003-)**, based on the Basic Act for Establishing a Sound Material-Cycle Society. Japan has implemented related measures in a comprehensive and structured manner, in order to develop a “sound material-cycle society” where the consumption of natural resources is reduced, and the environmental load is minimised to the extent possible. **The 4th Fundamental Plan was adopted in June 2018.** The 4th Plan indicates integrated measures toward a Sustainable Society, including: **Circulating and Ecological Economy; Proper Waste Management and Environmental Restoration; International Resource Circulation; Resource Circulation throughout the Entire Lifecycle; and Disaster Waste Management Systems.**¹²

- **UK:** In the UK, waste is a devolved responsibility. England, Scotland and Wales have separate strategies for dealing with resources and waste with the aim to move to a more circular approach, where materials are kept in use and reuse for as long as possible. Northern Ireland is currently developing a new waste prevention programme and waste strategy, aiming to publish them in December 2019.

- ▶ **'Our Waste, Our Resources: A Strategy for England'**,¹³ sets out a comprehensive and ambitious set of policies covering sustainable production, helping consumers take considered action, resource recovery/waste management, tackling waste crime, cutting down on food waste, international leadership, research and innovation as well as measuring progress and targets. This Strategy is underpinned by a number of key principles:

- To provide the incentives for people to do the right thing
- To prevent waste from occurring in the first place, and manage it better when it does
- To ensure that those who place on the market products which become waste to take greater responsibility for the costs of disposal, through invoking the 'polluter pays' principle
- To lead by example, both domestically and internationally
- To not allow our ambition to be undermined by criminality

- ▶ The Strategy will contribute to the delivery of five strategy ambitions: to double resource productivity by 2050; to eliminate avoidable waste of all kinds by 2050; to work towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025; to work towards eliminating food waste to landfill by 2030; to eliminate avoidable plastic waste over the lifetime of the 25 Year Environment Plan

- ▶ The Scottish Government published its Circular Economy Strategy "Making Things Last" in 2016. This set out Scotland's ambition to move to a more circular approach, where materials are kept in use and reuse for as long as possible and the economic opportunities are realised. The key ambitions under this strategy are: to cut food waste by a third by 2025, to ensure products to be designed for longer lifetimes, for second hand goods to become a good value, mainstream option, to empower Scotland's repair sector to grow. And to make recycling routine in every business and household, with more consistent local services; more packaging designed for recyclability, and every household having access to a food waste service.

- ▶ Wales has a set a goal for one planet resource use and zero waste by 2050 – and the circular economy is key to achieving this. Wales will be consulting on its revised waste strategy and circular economy route map later this year and will also be launching a new Circular Economy Investment Fund which will be targeted at increasing demand for recycled materials, with a particular focus on plastics used in manufacturing. Beyond the environmental benefits, Wales will seek to exploit the economic and social benefits that can be achieved in this move to a more circular economy in line with its duties under the Well-being of Future Generations Act.

- **US: Sustainable materials management (SMM) Program Strategic Plan for 2017-2022:** SMM is a systemic approach to using and reusing materials more productively and sustainably throughout their life cycles, generally minimising the amount of materials involved and all the associated environmental impacts. The SMM Program Strategic Plan 2017-2022 sets out three priority areas: 1) The Built Environment; 2) Sustainable Food Management; and 3) Sustainable Packaging, with additional emphasis areas on Sustainable Electronics Management, Life Cycle Assessment and SMM International Efforts, and Overarching Measurement Efforts.¹⁴

- **EU: Circular Economy Package (2018):** As part of its continuous effort to transform Europe's economy into a more sustainable one and to implement the ambitious **Circular Economy Action Plan**, in January 2018 the European Commission (EC) adopted a new set of measures, including: **a Europe-wide EU Strategy for Plastics in the Circular Economy; a legislative proposal to tackle single-use plastic products and fishing gear; a Communication on options to address the interface between chemical, product and waste legislation; a Monitoring Framework on Progress towards a Circular Economy** at EU and national level; and a **Report on Critical Raw Materials and the Circular Economy** that highlights the potential to make the use of the 27 critical materials in our economy more circular.¹⁵ In March 2019, the EC adopted the latest package of measures on circular economy. The package includes inter alia a **report on the implementation of the Circular Economy Action Plan**,¹⁶ that presents the main results of implementing the action plan and sketches out open challenges to paving the way towards a climate-neutral, competitive circular economy.



2.2. Institutional arrangements: inter-ministerial or cross-cutting activities on RE/CE/3R/SMM

RE/CE/3R/SMM cover a wide range of action areas, which might require inter-ministerial or cross-cutting activities. Several members have promoted inter-ministerial /cross-cutting / sector-wide discussion by establishing commissions or meetings/ committees, aiming at effective implementation of RE/CE/3R/SMM actions, strategy and vision as well as establishing a centre to facilitate and coordinate cross-cutting activities.

● **Canada:** The **Federal Sustainable Development Strategy** establishes goals and targets for 41 federal organisations, as well as highlighting the Government of Canada's actions in support of sustainable development in three-year cycles. The Strategy includes a goal for **low-carbon government**, including green public procurement objectives. The Centre for Greening Government was established in 2016 to coordinate, plan actions, and develop guidance for greening initiatives including specific targets related to procurement of products and waste diversion measures.^{17,18}

● **France:** The **National Council for Ecological Transition**, chaired by the Environment Minister, with members who are representative of all society stakeholders, is consulted on proposed legislation addressing environment or energy issues, as well as on national strategies related to sustainable development, which includes topics related to material resource efficiency. The Roadmap for the Circular Economy (action 48) plans to transform the **national circular economy council**. The **Circular Economy Institute** serves as a multi-actor body aiming to promote the circular economy and to accelerate its development by bringing together relevant stakeholders.¹⁹

● **Germany:** The **National Action Plan for Sustainability** is an internally binding regulation for federal authorities. It includes a selection of effective measures such as targets to be achieved by 2020 for textiles, recycling paper and car fleet. Federal authorities are also committed to procure products with the label **Blauer Engel** whenever possible. Also, to offer effective help to those responsible for public procurement, the Federal Government created the **Competence Centre for Sustainable Procurement (KNB)**, which works to establish sustainability criteria for greater extent in public procurement through advising all public procurement offices in Germany with regard to environmental, economic and even social criteria.^{8,10}

● **Italy:** The Italian Government adopted the directive of the Presidency of the Council of Ministers through which the **"National Commission for Sustainable Development"** is established in March 2018, chaired by the Presidency of the Council of Ministers with the participation of all Ministries and representatives of the regions, provinces and municipalities. The Commission is in charge of coordinating the implementation of the National Sustainable Development Strategy that recognises circular economy and resource efficiency as fundamental pillar within the "prosperity" dimension.²⁰

● **Japan:** The **Ministry of the Environment has a responsibility to coordinate government policies regarding a sound material-cycle society** based on the law. The Fundamental Plan for Establishing a Sound Material-cycle Society was drafted by the Ministry of the Environment, taking the recommendations by the Central Environment Council into consideration, and finally decided by the Cabinet. Also in order to integrate the 3R concept in relevant policies and programmes, **specific coordination meetings** have been held regularly among relevant ministries especially for jointly administrated regulations such as the Home Appliance Recycling Law, the Containers and Packaging Recycling Law, the Food Recycling Law, and the End-of-Life Vehicle Recycling Law.



● **UK:** In the UK, there are a number of cross-cutting initiatives on RE/CE/3R/SMM:

▶ Since the release of **Our Waste, Our Resources: A Strategy for England**, new forums have been developed in order to ensure the effective implementation of RE/CE/3R/SMM actions.

▶ There has also been close collaboration between the Department for Environment, Food and Rural Affairs and the Department for Business, Energy and Industrial Strategy on promoting resource efficiency and the circular economy, as well as with HM Treasury on fiscal measures.

▶ The **UK Resources Council**, a cross-industry body, has also been formed to negotiate a waste sector deal with the Government and help British industry make the most of the country's waste material, by ensuring that materials and resource management systems are designed with high value recovery and industrial users in mind.

▶ **Business in the Community** was created nearly 40 years ago by HRH The Prince of Wales to champion responsible business. Its **Circular Economy Taskforce** has been established to bring together a group of CEOs and other senior executives committed to delivering a high impact programme to bring the circular economy to life. Following the Waste to Wealth Summit in November 2018, Business in the Community will develop a programme of research, learning and action, working closely with Waste to Wealth Champions and supporting partners. By the end of the first year it will support businesses as they define individual and collaborative action plans and start to identify innovative solutions to shared challenges within and across sectors.

● **US:** Executive Order 13834 Regarding Efficient Federal Operations was issued in May 2018 and states that federal agencies must prioritise reducing waste, cutting costs, enhancing the resiliency of federal infrastructure and operations, and that these reductions should be tracked to ensure accountability. The Executive Order sets forth requirements that agencies have to meet to make the federal government's operations more sustainable, and agencies have to show compliance by tracking and reporting their performance.²¹

● **EU:** On 28 November 2018, the European Commission adopted a strategic long-term vision for a prosperous, modern, competitive and climate neutral economy by 2050 – **A Clean Planet for all**.²² The strategy shows how Europe can lead the way to climate neutrality by investing in realistic technological solutions, empowering citizens, and aligning action in key areas such as industrial policy, finance, or research – while ensuring social fairness for a just transition. The expansion of new systems and processes, with cooperation across sectors, is also required. A good example of such system-oriented approaches is the circular economy, which will harness a range of advanced solutions and foster new business models.

3. Concrete Policies and Actions Advancing RE/CE/3R/SMM

3.1. Plastics

Appropriate management of plastics through RE/CE/3R/SMM is essential to solve plastic waste issues. All members are active on plastic waste issues. Many members have developed national strategies to address plastic waste from the perspective of RE/CE/3R/SMM and have implemented various policy measures including bans on single-use plastics and microbeads, and refund schemes. Initiatives, coalitions and collaboration of/with the private sector (please see also sections 4.1.1, 4.1.3 and 4.3) and international cooperation have also been conducted to address plastic waste issues.

● **Canada:** In the context of Canada's G7 presidency in 2018, Canada led the development of the **Ocean Plastics Charter**,²³ which includes ambitious targets and actions along the entire lifecycle of plastics, as well as actions to advance education, research, innovation, new technologies and make on-the-ground improvements. The Charter has since been endorsed by multiple countries, businesses and organisations within and beyond the G7. In November 2018, Canada developed a domestic Zero Plastic Waste Strategy, which outlines the vision for plastics in a circular economy and main areas of policy intervention and action. An associated action plan is expected to be finalised by June 2019. As of July 2019, Canadian regulations prohibit the manufacture, import and sale of toiletries containing plastic microbeads.

● **France:** Since 2015, France has implemented several ban measures to reduce the use of plastics released into the environment:

- ▶ ban on oxo-fragmentable packaging or bags
- ▶ ban on single-use plastic bags²⁴
- ▶ ban on rinse-off cosmetics containing solid plastic particles²⁵
- ▶ ban on disposable plastic cups, glasses, and plates (from 2020)²⁶
- ▶ ban on cotton buds made of plastic for domestic use (from 2020)²⁷

The French Ministry for the Economy and Finance and the French Ministry for the Ecological and Inclusive Transition are currently working on the formulation of commitments regarding the use of recycled plastics in the main plastics user sectors (packaging, building, automotive and electronic and electrical equipment).

● **Germany: Packaging Ordinance (Verpackungsverordnung)** is an initiative for joint collection of light packaging with non-packaging waste made of the same materials (plastic and metal waste). Regarding EPR scheme, plastic producers can also be in charge of collecting directly (or indirectly through public or private companies in a competitive market), treating and disposing of their consumers' waste. Refund-schemes are

also implemented for glass and metal beverage packaging and plastic PET bottles.⁸

● **Italy:** In 2017, Italy has enacted three legislative measures which provide for **a)** a ban on the use of microplastics in cosmetics that will come into force in 2020, **b)** a ban on the use of non-biodegradable cotton buds which will come into force in 2019 and **c)** a ban on the use of lightweight plastic carrier bags, which came into force in 2018. In 2016, the Italian Ministry of Environment and the United Nations Environment Programme / Mediterranean Action Plan – Secretariat to the Barcelona Convention and its Protocols (UNEP / MAP) signed a bilateral cooperation agreement to develop and implement, also through transnational cooperation, paramount actions in the fields of: marine litter, marine spatial planning, integrated coastal zone management and marine protected areas. The budget for the implementation of the triennial Programme of Work (PoW) of the Agreement is more than EUR2 million.²⁸

● **Japan:** Japan adopted "**Resource Circulating Strategy for Plastics**"²⁹ in May, 2019, to promote overall circularity of plastics and will implement related measures, such as: prevention of marine plastics litter, including through reducing disposable containers and packaging; effective and efficient collection and recycling of used plastics including unused ones; and promoting improvement of bioplastic use and alternatives to fossil fuel-based plastics. In regard to the coastal and marine environment, the "**Marine Litter Act**" (Act on Promoting the Treatment of Marine Debris Affecting the Conservation of Good Coastal Landscapes and Environments to Protect Natural Beauty and Variety) was enforced in July 2009. Based on this Act, a Council for Promotion of Measures against Articles that Drift Ashore has been set up for the respective administrative agencies in local governments to coordinate and carry out a comprehensive, effective and efficient promotion of coastal drift handling measures.³⁰ Also, **Marine plastic litter implementation action plan** was adopted in May, 2019.³¹

● **UK:** The UK is taking ambitious action, including to eliminate all avoidable plastic waste over the lifetime of its **25 Year Environment Plan**.³² This ambition will be carried out through a number of measures and initiatives including:

▶ Eliminating problematic or unnecessary plastic packaging by 2025, including banning plastic products where there is a clear case for it and alternatives exist

▶ Tackling single-use plastic bags through requiring large retailers to charge for their plastic bags. In Wales, Scotland and Northern Ireland all sellers are covered under their carrier bag schemes

▶ Incentivising the use of reusable, recyclable or compostable plastic packaging through the use of extended producer responsibility

▶ Stimulating demand for recycled plastics including by introducing a tax on plastic packaging that contains less than 30% recycled content from April 2022 (subject to consultation)

▶ Consulting on the introduction of a Deposit Return Scheme (DRS) in England, Wales and Northern Ireland. Scotland has also consulted on introducing a DRS scheme

▶ Committing to making recycling easier, by tackling confusion over which items can be recycled.

▶ Wales has developed a Route map for Plastic Recycling to support and encourage the development of new business opportunities, innovations and technologies through the plastics chain

● **US:**

- The SMM Program Strategic Plan 2017-2022 supports a programme working to reduce plastic packaging entering into the nation's waters; and the EPA continues work with the private sector, nongovernmental organisations, and standards organisations to strengthen and support packaging criteria.³³

- The EPA has an ongoing agreement with the American Chemistry Council and the Sustainable Packaging Coalition to promote the sustainable management of plastics. Work under the agreement currently focuses on plastic wrap, film, and bags.³⁴

- On 16 January, 2019, a group of 30 global companies launched **the Alliance to End Plastic Waste** to promote solutions to eliminate plastic waste in the environment. This not-for-profit alliance committed over USD1.0 billion with the goal of investing USD1.5 billion over five years. They intend to develop and scale solutions to minimise and manage plastic waste, as well as enable circular economy approaches for used plastics.³⁵

● **EU:** The first-ever **European Strategy for Plastics in a Circular Economy** adopted on January 2018 will transform the way plastic products are designed, used, produced and recycled in the EU, while contributing to cutting GHG emissions and dependence on imported fossil fuels.³⁶ The **legislative proposal on certain single-use plastic products and fishing gear** was adopted by the European co-legislators in spring 2019. It envisages different measures to apply to different product categories. Where alternatives are easily available and affordable, single-use plastic products will be banned from the market, such as plastic cotton buds, cutlery, plates, straws, drink stirrers, sticks for balloons, products made of oxo-degradable plastic and food and beverage containers made of expanded polystyrene. For other products, the focus is on limiting their use through a national reduction in consumption; on design and labelling requirements; and waste management/clean-up obligations for producers.³⁷



3.2. Food waste

Food is one of the prioritised areas in RE/CE/3R/SMM as reflected in SDG12. Alliance members have also made efforts in measuring food loss and waste, concluded agreements with retailers, as well as conducting awareness-raising on food loss through webinars and campaigns. Some members have implemented laws on food waste recycling, for effective reutilisation as feed or in agriculture. Facilitating food donation and tackling left-over food in restaurants are also some common approaches among members. Agreements or commitment approaches with the private sector have also been taken.

● **Canada:** The Canadian national food policy includes initiatives to tackle food waste by supporting innovation in food processing, retail and food service sectors, engagement and monitoring programs. In spring 2019, through the **Commission for Environmental Cooperation**, Canada, Mexico, and the United States released a practical guide **"Why and How to Measure Food Loss and Waste"** on measurement of food loss and waste across the North American supply chain,³⁸ as well as a toolkit to engage youth on food waste reduction called **"Food Matters Action Kit"**.³⁹

● **France: The National Agreement against food waste and related initiatives:** In 2013, France adopted a National Agreement against Food Waste. This programme, led by the Ministry of Agriculture, brings together five ministries (Ministries in charge of agriculture, environment, education and some 50 stakeholders in the food chain) with a common aim of halving loss and waste by 2025, by informing consumers about good practices, and by strengthening donation of food products that are currently destroyed or thrown away.⁴⁰ Thus, since February 2016, supermarkets with floorspace of over 400 square meters must give away their unsold food and are now longer allowed to make food unfit for consumption. In addition, the recent "Agriculture and Food law" adopted on 2 October 2018, requires collective restoration to carry out a diagnosis to fight against food waste.

● **Germany:** BMEL (Federal Ministry for Food and Agriculture) has implemented its **Renewable Resources funding programme** since May 2015, which aims at improved sustainability and increased resource efficiency using biogenic resources at all stages of the value chain.⁸ BMEL announced **Cultivation for Resources Efficiency programme** in 2015. By integrating various programmes, this programme covers virtually all areas of crop cultivation in Germany.

● **Italy: The Italian National Plan to Prevent Food Waste,** adopted in June 2014, is a concrete example of participative process (multi-stakeholder platform), with two main areas of intervention, namely **a)** measures of prevention at source and **b)** recovery through donation to charities. In addition, in 2016 Italy has also adopted a national law (**Law no. 166 of 19 August 2016**) on "Provisions concerning the donation and distribution of food and pharmaceutical products for purposes of social solidarity and for the limitation of waste" which aims to encourage, recover and donate food, pharmaceuticals and other products to non-profit entities.⁴¹

● **Japan: The Act for Promotion of Recycling and Related Activities for Treatment of Cyclical Food Resources**⁴² (enacted in 2001, revised in 2007 and 2015) aims to reduce final disposal of food through waste prevention and waste reduction measures, and promote utilisation of recycled resources in food-relevant industries to increase food waste recycling as feed or fertilizer. Recycling/reduction targets have been set for each food relevant sector, such as the recycling targets by March 2020 for food manufacturers (95%), food wholesalers (70%), food retailers (55%) and the restaurant industry (50%). Also, the **'No Food Loss Project'**, a collaborative action across six ministries (Consumer Affairs Agency (CAA), Cabinet Office, Ministry of Education, Culture, Sports, Science and Technology (MEXT), Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Economy, Trade and Industry (METI) and Ministry of the Environment (MOE)), aims to reduce food waste at all stages of the food supply chain. Other actions include supporting food banks and no leftover campaigns at restaurants, including the **"3010 Campaign"** which aims at reducing food waste from banquets and parties by guiding participants to focus on eating in the first 30 minutes at the start and the last 10 minutes before the end of an event.⁴³



● **UK: There are several initiatives on food.** Key commitments (subject to detailed consultation) are around effectively redistributing food to those who need it most before it goes to waste; annual reporting on food surpluses and waste; legal powers regarding waste and food redistribution; and new food waste hierarchy; and awareness raising, cross sector collaboration through the Courtauld Commitment 2025.

● **US:**

- The SMM Program Strategic Plan 2017-2022 outlines priority action areas on sustainable food management, including through: 1) developing an infrastructure to support alternatives to landfill disposal of wasted food; 2) promoting opportunities across the entire food life cycle to reduce wasted food from landfills, with a preference for those approaches higher up on EPA's food recovery hierarchy; 3) and improving and standardising measurement of wasted food.⁴⁴

- The EPA has hosted over a dozen webinars related to food loss and waste issues since the launch of resource efficiency under the G7 in 2016. In May 2018, the EPA hosted a successful **webinar** featuring efforts in the US to combat food waste, the first in a series by G7 members committed to facilitate the exchange of best practices and lessons learned in reducing food loss and waste as part of the G7 Alliance on Resource Efficiency.⁴⁵

- In October 2018, the US launched the **Winning on Reducing Food Waste Initiative**, a collaborative effort among the EPA, the US Department of Agriculture (USDA), and the Food and Drug Administration (FDA), to reduce food loss and waste through combined and agency-specific action.⁴⁶

- On 1 April, 2019, President Trump acknowledged the month of April as Winning on Reducing Food Waste Month and encouraged public action and participation from all sectors.

- On 9 April, 2019 the EPA, USDA and FDA hosted an event and release an interagency strategy prioritising six main areas for action: 1) Enhance Interagency Coordination; 2) Increase Consumer Education and Outreach Efforts; 3) Improve Coordination and Guidance on Food Loss and Waste Measurement; 4) Clarify and Communicate Information on Food Safety, Food Date Labels, and Food Donations. 5) Collaborate with Private Industry to Reduce Food Loss and Waste Across the Supply Chain; 6) Encourage Food Waste Reduction by Federal Agencies in their Respective Facilities.

● **EU:** Under the EU CE Package 2018, the European Commission will: develop a common EU methodology to measure food waste and define relevant indicators; create a platform involving Member States and stakeholders in order to support the achievement of the SDG targets on food waste, through the sharing of best practice and the evaluation of progress made over time; take measures to clarify EU legislation relating to waste, food and feed and facilitate food donation and the use of former foodstuff and by-products from the food chain in feed production without compromising food and feed safety; and examine ways to improve the use of date marking by actors in the food chain and its understanding by consumers, in particular the "best before" label.⁴⁷

3.3. Green Public Procurement (GPP)

Governments and relevant authorities are some of the major consumers for economies. Based on such understanding, promoting Green Public Procurement and reflecting RE/CE/3R/SMM perspectives in procurement standards are recognised as effective approaches to facilitate transition. Some members conduct GPP to promote the use of resource efficient products.

● **Canada:** Green public procurement requirements are common across all levels of government in Canada. At the federal level, the Federal Sustainable Development Strategy outlines the Government's commitment to transition to low-carbon, climate-resilient, and green operations. There are requirements and guidance for federal organisations to apply life-cycle assessment principles in procurement decisions, including for real property and retrofit projects, as well as recent commitments to eliminate single-use plastics from government operations and focus on sustainable plastic products in procurement practices.

● **Italy:** In 2013 Italy adopted its national action plan (NAP) for GPP. The NAP GPP stipulates that the Ministry of the Environment set out the minimum environmental criteria (MEC), which represent reference points at national level for the use of GPP by contracting authorities.⁴⁸ **The national law no. 221 of December 2015, the so-called Collegato Ambientale, makes GPP mandatory (Article 19).** MEC, approved by ministerial decrees, have been published for 18 product groups, including buildings, vehicles, and food-and-catering services. For example, MEC for public lighting entered into force in 2018. To monitor the uptake of GPP, an agreement was signed in March 2018 between the Ministry of Environment and the National Anti-corruption Agency, identified by law as the body in charge of monitoring GPP.⁴⁹

● **Japan:** The **Green Purchasing Act** (Government's initiative to promote the procurement of recycled items)⁵⁰ was introduced in 2001. Pursuant to the law, government agencies are required to purchase environmentally-friendly goods and services in order to give private companies incentives to develop and deploy those goods and services. The law also encourages eco-labelling of environmentally-friendly goods and services, so that consumers have sufficient information when selecting these goods and services.¹²

● **UK:** Various measures including Greening Government Commitments as set out in *Our Waste, Our Resources: A Strategy for England* (chapter 2).

● **US:**

- The General Services Administration (GSA) developed the **Green Procurement Compilation** as a comprehensive green purchasing resource designed for federal government contracting personnel and program managers.⁵¹

- The GSA also developed the **Sustainable Facilities Tool**, an immersive online environment serving as a one-stop resource to support decision-making regarding sustainable building principles, materials and systems with content covering topics such as whole building systems, integrative design and life cycle approaches.⁵²

- The EPA developed **Recommendations of Specifications, Standards, and Ecolabels**⁵³ to help federal government purchasers identify and procure environmentally sustainable products and services. Some of the recommendations are based on an independent assessment of private sector environmental performance standards and ecolabels against the multi-stakeholder developed **EPA Guidelines for Environmental Performance Standards and Ecolabels**.⁵⁴



● **EU:** Europe's public authorities are major consumers. By using their purchasing power to choose environmentally-friendly goods, services and works, they can make an important contribution to sustainable consumption and production. Although Green Public Procurement (GPP) is a voluntary instrument, it has a key role to play in the EU's efforts to become a more resource-efficient economy. It can help stimulate a critical mass of demand for more sustainable goods and services which otherwise would be difficult to get onto the market. GPP is therefore a strong stimulus for eco-innovation. To be effective, GPP requires the inclusion of clear and verifiable environmental criteria for products and services in the public procurement process. The European Commission and a number of European countries have **developed guidance in this area**, in the form of national GPP criteria. The challenge of furthering take-up by more public sector bodies so that GPP becomes common practice still remains. As does the challenge of ensuring that green purchasing requirements are somewhat compatible between Member States - thus helping create a level playing field that will accelerate and help drive the single market for environmentally sound goods and services.⁵⁵

3.4. Actions to final demands and consumers / Citizen involvement and public awareness

Consumers as well as citizens have a crucial role to materialise a society based on RE/CE/3R/SMM. For consumers and citizens, educational approaches have been taken and campaigns organised. Regulating consumer goods use (for example, bans on single-use plastics), reconsideration to green claims, and encouraging reuse and repair are approaches which have been applied to facilitate a life-style transition for consumers and citizens.

● **Canada:** There are on-going public education campaigns on the 3Rs. These include regional recycling councils' annual **Waste Reduction Week** Canada,⁵⁶ the National Zero Waste Council's "**Love Food Hate Waste Canada**,"⁵⁷ and the Ocean Wise **#beplasticwise**,⁵⁸ supported by the different levels of government.

● **France:** France has a programme aiming to inform consumers on the environmental impacts of products. A **life cycle database** has been developed as well as calculation methodologies and calculators. Five sectors are piloting the environmental information: textile, electric and electronic products, hotels, furniture and some food products.⁵⁹

● **Germany: The Education for Resource Conservation and Resource Efficiency Network (BilRes)** was established to help build awareness of resource conservation and resource efficiency in all areas of education, develop ideas for an enabling framework to give incentives and remove obstacles, provide a platform for exchange on educational materials and bring together different stakeholders (e.g. policymakers, industry and researchers).⁸ In addition, the German Government's **Waste Prevention Programme**, with the involvement of the Federal Länder, sets out a systematic and comprehensive approach for preventing waste in the public sector, by recommending specific instruments and measures. It examines various approaches to waste prevention throughout the various stages of a product's lifecycle, including measures that address production, product design, retail, trade, and the use of products. Alongside the key criteria of waste prevention potential and ecological impacts, the analysis also considers economic, social and legal criteria.

● **Italy:** The Ministry of the Environment joined with the Ministry of Education to carry out activities for environmental education which is considered a key national priority to raise awareness among citizens and the community as a whole towards the environment and sustainable development. The National Charter includes Italy's contribution to the 2030 Agenda and on education for sustainable development, referring to circular economy and resource efficiency (Priority Area no.7).⁶⁰ Furthermore with the revision of the National Waste Prevention Program, a drastic reduction of waste is expected, in particular of plastic waste, also through the "plastic free" awareness raising campaign and the initiative to eliminate the use of plastic, especially for single use, in all public administrations. This initiative has echoed throughout Italy, finding great support also from schools and in other public institutions that are now phasing out plastics from their public buildings. Recently many awareness raising campaigns on the circular economy have been launched (for example "M'illumino di meno" 2019 that links CE with energy efficiency)

● **Japan:** The Ministry of the Environment set **30 May as "Zero Waste Day"** and promotes a week of campaigns, including city clean-ups with citizens and intensive patrols for prevention of illegal dumping. The campaigns run until 5 June which is "World Environment Day". In 2019, the Ministry will conduct "**Zero Marine Litter Week**"⁶¹ during this period to implement comprehensive coastal and land clean-up activities with various stakeholders including local governments, private companies, NGOs and citizen groups.

● **UK:** the government partially fund the Waste and Resources Action Programme (WRAP)^b which delivers a number of campaigns aimed at bolstering consumer and citizen engagement including:

▶ **Recycle Now:** this is the national recycling campaign for England, supported and funded by the government, managed by WRAP and used locally by over 90% of local authorities in England.

▶ **Love Food, Hate Waste:** this provides communications material that local authorities can draw on to promote food reduction in their area. The campaign aims to raise awareness of the issue and offer practical advice to help the public reduce their food waste.

▶ **Love your Clothes:** this aims to raise awareness of the value of clothes and to encourage people to make the most of the clothes they already have.

In addition to consumer campaigns, there have been a number of initiatives aimed at raising consumer awareness and bolstering citizen engagement. The UK has committed to providing consumers with better information and incentivising consumers to purchase sustainably through plastic bag charges. There is also work being done to encourage greater reuse and repair, including better use of household waste recycling centers as well as encouraging collaborative work with charities and across businesses and supporting consumer campaigns on reusable alternatives.

b: <http://www.wrap.org.uk/>

● **US:**

- The SMM Program Strategic Plan 2017-2022 promotes delivering tools and education, and convening networks to implement sustainable materials management practices.⁶²

- On 15 November, 2018 the EPA convened an **EPA Recycling Summit** bringing together leaders from industry and all levels of government to discuss current challenges and opportunities within the United States recycling system. During the Recycling Summit, the EPA and participants signed a pledge committing to work together to improve the state of the recycling system in the US. The Recycling Summit focused on four action areas (1) education and outreach, (2) enhancing materials management infrastructure, (3) strengthening secondary materials markets, and (4) enhancing measurement. Following the Summit, committees have been formed to develop some actions that can be taken to address challenges.⁶³

● **EU:** The EC has developed legislation to reduce the consumption of lightweight carrier bags and the environmental impact of packaging and packaging waste. The Commission develops standards, for instance on how long products should last or how easy they should be to repair and recycle, and it also supports sustainable consumption via certain aspects of the EU consumer law, such as the rules on unfair commercial practices, which prohibit misleading green claims.⁶⁴



3.5. Lifetime extension product policies, Remanufacture, Refurbishment, Repair and Direct Reuse (RRRDR) practices including reverse logistic chains

RRRDR has been discussed as an opportunity to promote RE/CE/3R/SMM and is an area of focus for the G7 Alliance and highlighted in the findings from the IRP. Various business practices are ongoing in this area. Among members, unique initiatives and policy approaches to facilitate RRRDR can be found.

● **Canada: Computers for Success** – The initiative aims to extend the value of disposed Government of Canada and other organizations’ IT assets by distributing refurbished computers to public educational institutions, charities, low-income families and recent refugees. In addition to resource efficiency gains through IT product life extension, the programme has resulted in a number of co-benefits including technical skill development for programme interns and improved digital inclusion for underserved populations.⁶⁵

● **France:** France has taken several initiatives, including regulatory, aiming to extend the lifetime of products. The 2014 Consumption Law increased consumer rights within the minimal guarantee of conformity and introduced a requirement on retailers and producers for **informing about the availability of spare parts**. In 2015, the law on Energy Transition and green growth made practices of planned obsolescence, if proved, a legal offense. In 2018, the new Roadmap for the Circular Economy plans the introduction by 2020 of a **repairability index on electric and electronic products**. Public authorities have started working on the development of this index with stakeholders. In France, there are also many private initiatives (retailers, some producers, social sector) related to repair, reuse or remanufacturing.

● **Japan:** Based on the Act on the Promotion of Effective Utilization of Resources, the government designated **“Specified Resources-Saved Products”**, which particularly require rational use of relevant raw materials and promotion of long-term use. Currently, automobiles, PCs and various home appliances have been designated as “Specified Resources-Saved Products”, and private companies that produce these products need to comply with guidance by the Ministry of Economy, Trade and Industry, to reduce use of raw materials and ensure product design includes long life-time and easy to recycle.

● **UK: Our Waste, Our Resources: A Strategy for England** has outlined commitments to use similar mechanisms to the EU Ecodesign system to drive more resource efficient production. This will include expanding the scope of eco-design principles to non-energy related products and will aim to ensure that manufacturers design their products so they are more durable, repairable and easier to disassemble. The Strategy also commits to exploring the role that guarantees and warranties can play in ensuring products stay in use and maintain their value for longer.

● **EU:** To address the need for a European-level solution to encourage remanufacturing throughout Europe, the **European Remanufacturing Network** (funded under the Horizon 2020 Programme) surveyed the level of remanufacturing activity by sector across the EU, which generated a number of high impact actions which could boost remanufacturing, for practitioners, policy-makers and researchers. As follow-ups, the Network will address the research pillar; support for the remanufacturing industry; and the policy and strategy needs of business through sector-focused representation.⁶⁶



3.6. Extended Producer Responsibility (EPR)

EPR schemes have been widely applied by all alliance members in the form of legislation or voluntary programmes / projects as a major policy tool for RE/CE/3R/SMM. Some members are currently trying to extend their scope to products that have not been covered.

● **Canada: Canada-wide Action Plan for Extended Producer Responsibility (CAP-EPR) (2009):** Through the CAP-EPR, Canadian jurisdictions committed to work towards development and harmonisation of extended producer responsibility schemes for a number of waste streams including packaging, printed materials, electronics and electrical products, construction materials, and appliances.⁶⁷ CAP-EPR has had a positive influence in establishing EPR programmes and requirements across Canada. Since its adoption, most sub-national governments have adopted related legislation and regulations.

● **France:** France has set up several extended responsibility schemes. The Roadmap for the Circular Economy **sets new targets for EPR schemes** to contribute to the circular economy and the development of new industrial sectors. For example, the Roadmap plans to **extend the scope of some EPR schemes** (end-of-life vehicles scheme to motor vehicles that are not yet covered as small cars and motorcycles, a “packaging” scheme for professional packaging to increase the percentage of bottles and cans collected in the cafe, hotel and restaurant sector). It plans also to deploy new EPR schemes in the toys, sports and leisure equipment, and DIY and gardening equipment sectors.⁶⁸

● **Germany:** In transposition of respective EU-requirements, Germany has successfully implemented ERP for several waste streams e.g. **packaging, electrical and electronic equipment, batteries and accumulators and end-of-life vehicles.**

● **Italy:** The new Strategy “towards a Model of CE for Italy” aims at revising the EPR rules in order to foresee **new models of EPR** and new models of consumer responsibility (**ECR: Extended Consumer Responsibility**) or even community responsibility.⁶⁹ Furthermore, pending the transposition of the new European Directive, compliance with the **EPR** (Extended Producer Responsibility) principle is guaranteed through a consortium system, created by legislative provisions which in some cases have established or recognised such consortia as mandatory and with the main purpose to pursue the recycling and recovery objectives set by the European and Italian legislation. The consortium system includes several consortia of the supply chain; CONAI (National Packaging Consortium)⁷⁰ is one of those, which is made up of about 1 million manufacturers and users of packaging. The CONAI System guarantees respect for the EPR, by requiring all producers belonging to the consortium to pay their environmental contribution, which is something that everyone is obliged to pay. During the last two national conventions of major Italian consortia held in Rome in April and in October of 2018, the main goal has been to conceive and develop a programmatic platform for the analysis of opportunities, challenges and obstacles, as well as policies and measures necessary to improve the quality of the sector.

● **Japan:** Japan has progressively implemented EPR, with several **specific recycling Acts which apply the concept of EPR such as laws on packaging, home appliances, end-of-life vehicles and small home appliances as well as the Act on the Promotion of Effective Utilization of Resources.** These Acts cover: packaging and containers (glass bottles, PET, paper containers and packaging, plastic containers and packaging; aluminum cans, steel cans, paper cartons/tetrapak style, cardboard; automobiles; four types of home appliances (TVs, refrigerators, air-conditioners, and washing machines/washer + dryers); personal computers under the Act on the Promotion of Effective Utilization of Resources; compact researchable batteries under the Act on the Promotion of Effective Utilization of Resources; small home appliances including PCs, mobile phones, and small electronic devices.⁷¹



- **UK:** The UK has committed to reforming its packaging producer responsibility system. The proposed models for reform embody the principles of EPR by requiring packaging producers to fund the full net costs of managing their packaging products at end of life. It is also proposed that producers would pay more if their products are not easily recyclable. This should incentivise producers to design their packaging in a more sustainable way, including ensuring that it is easier to recycle at end of life. **Our Waste, Our Resources: A Strategy for England** also sets out plans to harness the potential of EPR for other product types. By 2025, we will have reviewed and consulted on measures such as EPR for five new waste streams, two of which we plan to complete by 2022. The five waste streams we have identified as priorities are priorities textiles, bulky waste (including mattresses, furniture and carpets), certain materials in the construction and demolition sector, vehicle tyres and fishing gear.

- **US:** The EPA designed and manages the **Sustainable Materials Management Electronics Challenge** which encourages electronics manufacturers, brand owners and retailers to voluntarily strive to send 100% of the used electronics they collect from the public, businesses and within their own organisations to third-party certified electronics refurbishers and recyclers. The Challenge also recognises their advancements in designing products and implementing policies that contribute to making consumer electronics more sustainable throughout their lifecycle.⁷²

- **EU:** With the **new EU waste legislation adopted in 2018, the EU introduced mandatory EPR** for packaging, in addition to the existing EPR obligations for vehicles, electrical and electronic equipment and batteries. The Commission proposal to address single use plastic products includes EPR obligations for other product categories, notably fishing gear, food and beverage containers, wet wipes and tobacco filters. The new EU waste legislation also established minimum requirements for EPR schemes that will improve their effectiveness and governance. Those requirements foresee in particular that producers will cover the costs of waste treatment in order to achieve high recycling levels and that the contributions paid by producers have to be modulated based on the durability, reparability, re-usability and recyclability of their products and the presence of hazardous substances, thereby taking a life-cycle approach. The European Commission is working on guidance on the modulation of producers' contributions.

3.7. Industrial symbiosis

Industrial symbiosis is highlighted as one of the key measures to promote RE/CE/3R/SMM, which could lead to maximum utilisation of resources and could bring socio-economic opportunities. To promote industrial symbiosis, alliance members have taken various measures such as facilitating business networks, knowledge-sharing, and developing infrastructures.

● **Canada:** Building on efforts by the sub-national levels of government and in the private sector, the Government of Canada supports the **National Industrial Symbiosis Program, Canada**, which organises workshops to examine various resource categories and facilitate business-to-business linkages to reduce emissions, implement innovation, increase resource efficiency, and retain or create employment.

● **France: The national programme for inter-business synergy (PNSI):** An experimental programme in Industrial and Territorial Ecology (a concept that can also be referred to as “industrial symbiosis”), was initiated by the Institute of the Circular Economy in June 2015 for a period of two years. The PNSI has been rolled out in four regions (Auvergne-Rhône-Alpes, Brittany, Normandy and New Aquitaine) and its aim is to put businesses in direct contact using workshops.⁷³ Between 2015 and 2017, 17 workshops were organised bringing together more than 550 companies. A national network of interbusiness-synergy, called SYNAPSE was created in November 2017. It aims to facilitate exchanges between local industrial symbiosis project leaders via collaborative tools, working groups and meetings and to promote the capitalisation of experience feedback including the economic, environmental and social benefits.

● **Germany:** Providing support to encourage engagement of economic actors in a network for fostering eco-innovation and knowledge sharing; UK and Germany hosted a workshop in October 2015.⁷⁴ The Federal Ministry for Economic Cooperation and Development (BMZ) advises partner countries in the development of environmentally sustainable entrepreneurship and markets, by promoting joint use of services, materials and by-products among companies (industrial symbiosis).

Small and medium-sized enterprises (SMEs) often lack the capacities to deal with resource efficiency. The **VDI Centre for Resource Efficiency (VDIZRE)** was established by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Association of German Engineers (VDI) in order to close this gap. Its mission aims at knowledge transfer for resource-efficient management - in the interests of environment and enterprise.⁸

● **Italy: Symbiosis Users Network (SUN)** - On 21 April 2017 a cooperation agreement was signed for the establishment of a “Symbiosis Users Network (SUN)” between Ministry for the Environment, Land and Sea, ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development), Confindustria, some Italian Universities and various associations operating in the field of the environment.⁷⁵ **Sicilia’s Ecoinnovation**

Simbiosis System – (promoted by ENEA) aims at providing a methodology and an instrument for **Industrial Symbiosis** implementation on a regional scale, to implement a platform as a support to SMEs to individuate symbiosis opportunities in the region.⁷⁶

● **Japan:** In order to create “cycling” of reusable resources to create a Sound Material-Cycle Society, the Ministry of Land, Infrastructure, Transport and Tourism has specified 22 ports throughout Japan as **Recycle Ports (Integrated Reverse Logistic Base Port)** for wide-spread flow of reusable resources. At the Recycle Ports, activities are undertaken such as securing coastal facilities like wharfs, aiding in establishing facilities for handling reusable resources, promoting cooperation between civil and government sectors, and operations related to handling reusable resources.⁷⁷

● **UK:** the government is exploring different models for business clusters to promote resource efficiency at the local level, which will range from area-based schemes to sectoral and cross-sectoral approaches.

● **US:** The **U.S. Business Council on Sustainable Development’s Materials Marketplace** is a regional and national platform to facilitate company-to-company industrial reuse. Through the cloud-based platform, traditional and non-traditional industrial waste streams are matched with new product and revenue opportunities, ultimately enabling the culture shift to a circular, closed-loop economy. In addition to diverting waste from landfills, these recovery activities generate significant cost savings, energy savings, and create new jobs and business opportunities.

● **EU:** The EU Circular Economy Action Plan aims to promote innovative industrial processes including industrial symbiosis. In the new rules on waste management,⁷⁸ **the rules and definition of by products** are clarified, helping to facilitate industrial symbiosis exchanges and strengthening the internal market to create a level-playing field across the EU. The EU is also supporting innovation in industrial symbiosis through its research and innovation programme Horizon 2020. The European Commission is currently launching a call for tenders to establish a network of businesses⁷⁹ - **Cir@Lean** - in order to endorse voluntary guidelines for reporting on the industrial symbiosis exchanges. The industry-led stakeholder-inclusive network for the measurement of gains and benefits from the industrial symbiosis exchanges will setup online tools facilitating industrial symbiosis exchanges and will manage the attribution of a specific European label to compliant economic operators compliant.

3.8. Research and economic analyses

Members have shared recognition that RE/CE/3R/SMM would have economic and social benefits described in previously adopted communiqués and documents. Research and economic analysis is crucial to identify and promote economic, social and innovative opportunities. G7 has asked the IRP to provide economic implications of RE as shown in Box 2. Some members have also conducted economic analysis at the national level. In addition, promoting research for RE/CE/3R/SMM is a common approach among members.

● **Canada:** In 2018, an **economic analysis of the Canadian plastic industry, market and waste** was conducted to quantify plastic waste, and economic, environmental and social opportunities under a 2030 scenario with 90% landfill diversion.

● **France: The assessment of the benefits of recycling:** The Federation of Recycling Industries (FEDEREC), in partnership with the French Environmental Agency (ADEME), has carried out a study to assess the environmental benefits of recycling in France. France is currently developing a **macroeconomic model on the circular economy** to evaluate the economic impacts (GDP, jobs, trade balance) and environmental impacts (material productivity, carbon emissions, etc.) of various measures aimed at improving the efficient use of resources.

● **Germany:** There are three implementation-oriented flagship initiatives under **BMBF Framework Programme on Research for Sustainable Development (FONA)** (2015-2020): Green Economy, City of the Future, and the Transformation of the Energy System. Interdisciplinary and transdisciplinary collaboration has intensified between researchers and business enterprises.⁸

● **Italy:** Efforts are being made on macroeconomic modelling for resource efficiency and circular economy led by OECD – Environment Department. On 11 June 2018, the Italian Ministry of Environment participated to an international workshop in Paris along with main experts in the field.⁸⁰

● **Japan:** The Ministry of the Environment is promoting research and development in the field of the environment including climate change, biodiversity and resource efficiency, through various policy tools, including the **Environment Research and Technology Development Fund**,⁸¹ which is a competitive research fund to encourage advanced research activities by academia and research institutes.

● **UK: Research**⁸² suggests that adopting Resource Efficient Business Models in the UK could stimulate employment and economic growth, reduce raw material demand and reduce greenhouse house gas emissions. Yielding the environmental, social and economic benefits of policies aimed at transitioning

towards a circular economy is a key aim of **Our Waste, Our Resources: A Strategy for England**. The strategy sets out plans to enhance data collection and indicators for monitoring and evaluation, with some shift towards impact-based targets, which will, for example, be more relevant for impacts on natural capital, particularly carbon, when compared to weight-based targets.⁸³ A Detailed Evidence Annex⁸³ has been published to support the new strategy, showing that whilst there is evidence that the UK is gradually becoming more resource efficient, there is clear evidence around the benefits of intervention to allow the UK to continue on this trajectory, by using levers such as regulations, fiscal incentives and the provision of information to allow the market to deliver a more efficient outcome.

● **US:**

- The EPA recently released a **Recycling Economic Information (REI) Report** to increase the understanding of the economic implications of material reuse and recycling. The 2016 REI Report includes updated information about the number of recycling jobs, wages, and tax revenue. The report shows that recycling and reuse of materials creates jobs, while also generating local and state tax revenues.⁸⁴

- The EPA is developing **Sustainable Materials Management Prioritization Tools**—life cycle-based tools for non-expert users interested in identifying opportunities for significant environmental improvement at national, state and organisational levels. These tools use data from the EPA's United States Environmentally-extended Input-Output model, a fully transparent, open and freely available model.⁸⁵ The EPA expects to release the first public version of the SMM Prioritization Tools in 2019.

- The EPA, the Department of Agriculture, the Department of Defense, the Department of Energy, the Fish and Wildlife Service, the Federal Highway Administration, and the Federal Aviation Administration formally collaborate on life cycle assessment (LCA) and its applications through the **Federal LCA Commons Initiative**. The technical working group focuses on data, method, and tool development, including harmonisation tools, data conversion tools and LCA data automation.⁸⁶

4. Eye-opening Actions by Multiple Actors and Support by Members

Recently, there have been several eye-opening, concrete actions by G7 Members regarding the private sector, cities and local government as well as international and regional cooperation to promote RE/CE/3R/SMM. Some best practices are listed below:

4.1. Facilitating private sector action

4.1.1. Supporting private sector action (including finance, investment schemes)

The need for financing and investment to promote RE/CE/3R/SMM is highlighted in the IRP report and OECD policy guidance, the formulation of which was invited by the G7. Alliance members are financing projects, activities, facilities and technologies of RE/CE/3R/SMM through funds, programmes, foundations and governmental organisations.

● **Canada:** In 2018, the **Innovative Solutions Canada**, in collaboration with a number of federal government ministries launched a CAD12 million plastics innovation challenge to fund new technology solutions to reduce plastic waste in sectors such as food and transportation and to improve plastic waste value recovery. **Sustainable Development Technology Canada (SDTC)** is a foundation created by the Government of Canada to support Canadian companies with the potential to become world leaders in their efforts to develop and demonstrate new environmental technologies that address climate change, clean air, clean water and clean soil.⁸⁷

● **France:** The Investment Programme for the Future provides financial support for circular economy projects. **ADEME (the French Environment and Energy Management Agency)** is the most important funding structure for the circular economy. Between 2010 and 2017, EUR214 million have been devoted to circular economy projects. In addition, the roadmap for a circular economy plans to support 2000 voluntary companies to streamline their resource consumption, reduce their waste generation and ensure regular savings.⁸⁸

● **Germany: Partnership Agreement between Germany and the European Commission for the implementation of the European Structural and Investment Funds** in the 2014 to 2020 funding period confers on the Länder the ability through their funding programmes to finance resource efficiency projects with EU resources. Also, BMUB's **Environmental Innovation Programme (UIP)** supports industrial-scale projects that demonstrate the implementation of advanced products, processes and systems to avoid or reduce environmental impacts. This links the environmental technology between R&D and the market launch.⁸

● **Italy:** The Ministry for the Environment, Land and Sea (IMELS) developed the **Catalogue of Environmentally Harmful Subsidy and Environmentally Friendly Subsidies** (February 2017, new version 2018 forthcoming), intended to

identify their broadest definition and include, among others, incentives, facilities, subsidised loans and exemptions from taxes directly aimed at environmental protection, not to discourage environmental behaviour induced by misleading price signals and unpriced environmental externalities.⁸⁹

● **Japan: Promoting and evaluating business related to 2Rs (Reduce and Reuse)**¹² including sharing, and disseminating the importance of the concept of "Mottainai" to other countries and improve understanding of valuing products. Also, the Ministry of the Environment manages and promotes: 1) the **Green Bond Issuance Promotion Platform**, an online platform that provides financial support to conduct external review and gain consulting services for business and cities that plan to issue green bonds,⁹⁰ and 2) the **Japanese Green Fund**, a finance initiative to build a low-carbon society aiming to use private capital to tackle global warming.⁹¹

● **UK:** In the UK, the government is committed to facilitating private sector action and has done so through a number of initiatives:

- The **Industrial Challenge Strategy** Fund is part of the government's strategy to raise productivity in the UK. The fund is a core pillar in the government's commitment to increase funding in research and development by GBP4.7 billion over four years to strengthen UK science and business.

- The Accelerated Growth Fund Ltd is a wholly owned subsidiary company of WRAP, which operates the 'Circular Economy Investment fund' – a GBP10 million fund that makes investments and loans to companies, principally SMEs, who are investing in or changing to circular economy business models. The fund supports the developments of WRAP's overall strategy to close the loop in the sectors it focuses on – food and drink, textiles, electricals and resource management. The scope includes re-use, recycling and reprocessing. The fund will also continue to support anaerobic digestion.

● **US: The EPA's WasteWise program** encourages organisations and businesses to achieve sustainability in their practices and reduce select industrial wastes. Partners demonstrate how they reduce waste, practice environmental stewardship and incorporate sustainable materials management into their waste-handling processes. Benefits of joining WasteWise include opportunities to receive WasteWise Awards for outstanding achievements, public recognition in WasteWise publications, case studies, meetings and on EPA's website, reduced purchasing and waste disposal costs, and outreach and educational materials and free one-on-one technical assistance via the WasteWise Helpline.

● **EU:** promotes several policies and programmes on this item.
- **Horizon 2020:** the biggest EU Research and Innovation programme ever with nearly EUR80 billion of funding available over seven years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.⁹²

- **Single Market for Green Products Initiative:** proposes measurement of environmental performance throughout the lifecycle, the Product Environmental Footprint (PEF) and the Organisation Environmental Footprint (OEF); the use of these methods to all stakeholders; and principles for communicating environmental performance, such as transparency, reliability, completeness, comparability and clarity.⁹³

- **A Circular Economy Finance Support Platform in collaboration with the European Investment Bank:** brings together investors and innovators. It issued guidance to member states on converting waste to energy, as well as proposing a targeted improvement of legislation on certain hazardous substances in electrical and electronic equipment.

- **LIFE Programme:** The LIFE programme is the EU's funding instrument for the environment and climate action. LIFE contributes to the implementation, updating and development of EU environmental and climate policy and laws by co-financing projects with European added value.⁹⁴ Since its creation in 1992, LIFE has been through different funding periods. The current funding period 2014-2020 has a budget of EUR3.4 billion. LIFE co-finances projects in the environmental sector, including in the green and circular economy.



4.1.2. Best practices by companies and business coalitions

Developing coalitions and facilitating networking are also popular approaches among members. Such networking is developed by both governmental and private sector initiatives. Giving awards to actors for best practices is another common measure. Furthermore, some alliance members carry out unique initiatives at the national or regional level, or on specific topics such as paper, textiles or plastics.

● **Canada: Circular Economy Leadership Coalition**

consists of a group of industry and business leaders in Canada that aims to provide thought leadership, technical expertise and a collaborative platform for the development of pioneering solutions that eliminate waste at all stages of the life cycle of products and accelerate the transition to a circular economy.⁹⁵ The first of its kind in the world, the **Carbon Bank Program** by Compugen Finance offers companies and institutions carbon offset credits for disposed IT assets that are refurbished and resold.⁹⁶ **Plastic Bank** enables the exchange of plastic waste for money, items or Blockchain secured digital tokens to empower recycling ecosystems around the world and stop the flow of plastic into oceans.⁹⁷ The **Ontario Textile Diversion Collaborative** focuses on increasing consumer awareness, advocating for regulatory and standards requirements, conducting research and data collection, and developing recycling capacity to create a circular textile economy.

● **France:** In 2017, **33 companies from 18 sectors have been engaged in the circular economy**, through 100 actions from the waste management and recycling to eco-design and product service system, from sustainable sourcing to industrial symbiosis, or even the industrial symbiosis, the product life time extension in support of responsible consumption practices. These commitments are regularly monitored and the results are published. In 2018, the French Association of Large Companies (AFEP), announced that 21 new commitments have been made by 12 companies.⁹⁸

● **Germany: AGRAPA**, the alliance of paper industry associations and organisations, paper importers, paper wholesalers, the printing industry and publishers, made a voluntary commitment as early as 1994 to increase the recycling of waste printing paper in several stages.⁸

● **Italy:** In November 2018, Confindustria (General Confederation of Italian Industry) presented a position document on **"The role of Italian industry in the Circular Economy"** that highlighted the leading role that the industry can play to facilitate the transition towards the circular economy. In addition, the **FISE UNICIRCULAR (Circular Economy Enterprises Union)** organised a series of workshops on a monthly basis to deepen the issues related to the circular economy and collect information on the needs of companies. Furthermore eight large Italian companies have launched an Alliance for a Circular Economy and signed a **"Poster on Circular Economy"** to identify and disseminate national best practices on circularity. The poster featured the signatures of leading Italian companies promoting Made in Italy, in support of a circular economy that is "able to favor the establishment of new, more efficient and sustainable business models, involving numerous actors along the entire value chain."⁹⁹

● **Japan:** The **Japan SDGs Award**¹⁰⁰ was established at the third SDGs Promotion Headquarters meeting in June 2017. In this initiative, companies, local governments and NGOs/NPOs are awarded for their outstanding efforts on sustainable development based on the opinions of a wide-range of stakeholders who have expertise in the SDGs. In addition, with specific focus on the plastics issue, the **Plastics Smart Forum** was initiated in January 2019 to award best practices and accelerate information/knowledge-sharing and dialogues among companies and organisations working on the issue and involved in the **"Plastics Smart Campaign"** (for details: see section 4.3).¹⁰¹ In parallel, the **Clean Ocean Material Alliance** was established by the Ministry of Economy, Trade and Industry (METI) to promote sustainable use of plastic products and the development and introduction of alternatives to plastics, as well as to promote innovate solutions for marine plastic debris.¹⁰²

● **UK:** There are a number of examples of best practice amongst companies and business coalitions in furthering resource efficiency in the UK:

- The **Industrial Strategy**¹⁰³ outlines that the UK will support businesses over the long term through innovative approaches to resource efficiency. Through this strategy, the government will work with industry to explore options to introduce electronic tracking of waste. This will support the development of new markets for waste materials and improve the efficiency of enforcement, creating a level playing field for the waste and resources sector

- The **Sustainable Clothing Action Plan (SCAP)** is an industry-led action plan which aims to deliver positive environmental and economic outcomes to organisations, by reducing carbon, water and waste through the SCAP 2020 commitment.

- The **UK Plastics** Pact has been a success in bringing on board industry players. The Pact comprises over 100 business members including retail, manufacturing, hospitality, the plastic supply sector, plastic recycling and resource management. WRAP estimates these members are responsible for over 85% of the plastic packaging on the market.

- The UK's BITC-initiated 'Waste to Wealth commitment' has also seen over 200 leaders from business, government, academia and civil society coming together to create radical new solutions to double resource productivity and eliminate avoidable waste by 2030.

● **US:**

- In the private sector a nonprofit with more than 45 corporate sponsors, **The Recycling Partnership (RP)**, is working to improve recycling in the public sector. Since its inception five years ago, more than USD50 million of new recycling infrastructure has been launched across the U.S., and the public-private partnership continues to add new private and public partners, including the EPA. With PepsiCo's USD10 million contribution an initiative was launched calling on other private-sector members to join PepsiCo for a total fundraising goal of USD25 million allowing the coalition to reach more than 25 million US families with better community recycling programme.¹⁰⁴ The EPA and the Department of Agriculture welcomed new members to the **US Food Loss and Waste 2030 Champions** group where businesses and organizations commit to reducing food loss and waste in their own operations by 50% by the year 2030.¹⁰⁵

- The **Sustainable Purchasing Leadership Council**, founded in 2013, is an independent, non-profit and non-governmental organisation whose mission is to support and recognise purchasing leadership that accelerates the transition to a prosperous and sustainable future. SPCL is structured as a collaborative multi-stakeholder space to enhance clarity, consistency and coordination around sustainability in the institutional procurement marketplace. The Council also developed Guidance for Leadership in Sustainable Purchasing v2.0. They developed the SPLC BENCHMARKSM program that enables diverse organisations to assess their own sustainable purchasing activities against the recommendations in SPLC's Guidance and to benchmark the maturity of their sustainable purchasing activities against those of other organisations. The SPLC consists of more than 180 members with over USD300 billion in collective purchasing power.¹⁰⁶

● **EU:** In December 2018, the European Commission launched an alliance of key industry stakeholders covering the full plastics value chain as part of its ongoing efforts to reduce plastics littering, increase the share of recycled plastics and stimulate market innovation. The **Circular Plastics Alliance**¹⁰⁷ will pursue three main operational objectives:

- Fostering short-term, voluntary and coordinated actions and investments by key industry stakeholders. These actions and investments aim to cover separate collection of plastic waste; harmonised reporting on collection and recycling rates and volumes; investments in sorting and recycling facilities; voluntary standards on the 'design for recycling' of plastic products and others.

- Reporting on the obstacles which may hamper stakeholders' efforts to fully deliver on their pledges and to reach the target set for 2025. Some of those already identified include lack of infrastructure, insufficient access to finance and standardisation gaps.

- Monitoring progress made towards more plastics recycling and more uptake of recycled plastics in Europe. The monitoring should help identify the gaps in the supply and demand for different recycled plastics. In parallel, new voluntary commitments will be encouraged.

4.2. Local governments and cities

4.2.1. Supporting local actions for RE/CE/3R/SMM

Alliance members have supported local governments through financing by projects and governmental organisations to promote, for example, strategy development, institutional management capacity, infrastructure development and innovation. Giving awards for good work by local actors is also a common measure.

● **France:** The mandatory regional plan for waste prevention and management must include a regional action plan for the circular economy (August 2015). **To help local authorities develop this plan, ADEME** has drawn up a methodological document to help local authorities develop their circular economy plan, and more generally, the plan for waste prevention and management. Regional plans for waste prevention and management are under development. The first of them was adopted in October 2018, and most of them should be finalised by the end of 2019.¹⁰⁸

● **Germany:** In order to mobilise local potential for resource conservation, the Federal Government launched the **German Sustainability Award for Municipalities**, which aims at awareness building among municipal and business decision-makers as well as carrying out intensive public relations work. As for the research objectives, the **Kommunen Innovativ ('Innovative Municipalities') programme** has been promoted to strengthen the role of municipalities as initiators, partners and addressees of research, development and innovation for sustainable, demographically resilient regions in Germany.¹⁰

● **Italy:** With the support of the **European Social Fund and the European Fund for Regional Development**, Italy has launched several projects aimed at implementing a comprehensive strategy to strengthen administrative capacity, the efficiency of public administration and multilevel governance, with particular regard to regional and local governance, to plan and manage the transition of the local territorial systems towards a more resource-efficient and circular economy, through the use of integrated policy tools (Creiamo PA project) and with opportunities to invest in the circular economy. Furthermore, in 2018, the **Italian Circular Economy Stakeholder Platform** was launched through the National Agency for new technologies, energy and sustainable development. This is a network similar to the European

platform (i.e. ECESP), with the objective of creating a point of national convergence of initiatives, experiences, criticalities, perspectives of the Italian system on circular economy. One of the specific topics of the platform is circular cities.

● **Japan: "Circulating and Ecological Economy/ low carbon eco-town promotion project"** identifies problems, supports feasibility studies, creates thematic guidebooks, disseminates best practices, and provides expert advice etc. Some project examples in FY2017 include a feasibility study for commercialisation of electricity utilisation by dry distillation and gasification of community unused resources, mainly using the medium of mushrooms (Nakano City - Nagano Prefecture); a feasibility study for commercialisation of waste collection and transport system optimisation using the IoT (Kawasaki City - Kanagawa Prefecture, Nakasho Co. Ltd, NEC Corporation).

● **UK:** The Government has an ambition for a consistent set of **dry recyclable materials and separated food waste to be collected by councils from all households in England**. This ambition extends to businesses in England to separate recyclable waste and food waste (where this is produced) from other waste and arrange for their collection. All these measures are currently being consulted on.

Wales and Northern Ireland have statutory municipal waste recycling targets for local authorities (70% for 2025) and will consult in 2019 on increasing them after 2025. The Scottish Government has agreed a Household Waste Recycling Charter with the majority of local authorities to improve consistency of collections.

Retailers also have obligations, either to **take back waste electrical equipment from consumers**, or to engage in a **Distributor Take-back Scheme** which provides funding for local authorities to support collection and reuse.

● **US:** On 15 November 2018, the EPA convened an **EPA Recycling Summit** bringing together leaders from industry and all levels of government to discuss current challenges and opportunities within the United States recycling system. During the Recycling Summit, the EPA and participants signed a pledge committing to work together to improve the state of the recycling system in the US. The Recycling Summit focused on four action areas (1) education and outreach, (2) enhancing materials management infrastructure, (3) strengthening secondary materials markets, and (4) enhancing measurement. Following the summit, committees have been formed to develop some actions that can be taken to address challenges.

● **EU:** The role of cities for circular economy is crucial, as also shown in the EU Urban Agenda.¹⁰⁹ Cities, towns and suburbs provide a home to almost three quarters of the EU-28's population. However, social and economic concentration of resources in cities can result in undesirable side-effects, including negative environmental impacts such as pollution of air and water, huge waste generation, climate change impacts, reduced biodiversity, etc. That is why establishing sound circular cities is a crucial challenge for the years to come. In particular, European municipal authorities are encouraged to set circular procurement requirements to create further demand for green products and new markets for creative sustainable businesses. Moreover, cities can register public administrations on the **European Eco-management and Audit Scheme (EMAS)**.



4.2.2. Best practices by local governments/cities and cities coalitions

Some cities and local governments in member countries have developed RE/CE/3R/SMM systems. Some of them have zero-waste strategies, specific projects on food and buildings, and they are creating alliances and developing waste-to-energy systems using residual biomass.

- **Canada:** circular economy policies and strategies are developed by local administrations. Leading examples include: **Strategy for a Waste-Free Ontario: Building the Circular Economy (2017);¹¹⁰ Vancouver Zero-Waste Strategy 2020;¹¹¹ Toronto Long-Term Waste Strategy 2026;¹¹² Calgary Zero Waste Strategy 2025;¹¹³ and Sustainable Montreal 2020 Plan.¹¹⁴**

- **France: Sustainable territorial food project:** The village of Mouans Sarthoux has an approach that concerns the establishment of new territorial food governance favouring organic food in mass catering, based on proximity channels, seasonality and the reduction of food waste.¹¹⁵

- **Germany: Alliance for Resource Efficiency Baden-Württemberg** aims to demonstrate potential savings of resources and energy by highlighting good practices from 100 SMEs in Baden-Württemberg (100 Enterprises for Resource Efficiency). Other planned outcomes are to support knowledge transfer by building regional networks and regularly hosting a Congress on Resource Efficiency and Circular Economy.¹⁰

- **Italy:** The Ministry for the Environment, Land and Sea Protection has signed a Memorandum of Understanding: "**CITTA 'per la CIRCOLARITA'**" with the cities of Bari, Prato and Milan. The protocol aims at starting a collaboration between the Ministry and the three cities to experiment, test and promote joint "demonstrative" initiatives and innovative features on high environmental impact themes such as design of products and services; supply of models for the most efficient raw materials, production and distribution/marketing; extension of the useful life of products and models of reuse; sustainable consumption patterns and sharing economy activities; and recycling resources from waste.¹¹⁶

- **Japan:** Many Japanese cities have promoted initiatives towards a Sound Material-Cycle Society. The Ministry of the Environment, Japan promoted and supported such local initiatives, known as the "**Circulating and Ecological Economy**", including:

- **Ooki Town** in Kyushu with a population of 14,300 issued a "**zero waste statement**" and installed a biogas plant using kitchen organic waste. This initiative increased the recycling rate drastically from 14.9 % in 2005 to 63.1% in 2015, as well as reducing incineration by 56% over 10 years and saving JPY30 million in annual management costs. This also achieved local job creation, ensured savings in fertilizer fees and reduced the burden on local farmers because liquid manure was delivered by the plant. Ooki Town also saw a reduction in GHG emissions.

- **Miyama City** in Fukuoka Prefecture is the first Japanese city to make a commitment to develop the infrastructure for renewables-based energy self-sufficiency without relying on large power companies, and to balance the need for local economic revitalisation with environmental conservation. By jointly investing with the private sector, Miyama City created a company called "Miyama Smart Energy" to supply power from renewables such as biomass and PVs to households within the city as well as to public facilities at cheaper rates than those of the regional power company, Kyushu Electric Power Co.¹¹⁷

- **Shimokawa Town** in Hokkaido, the first recipient of the Japanese Prime Minister's Award of the 2017 Japan SDGs Awards, has promoted various activities based on the concept of reaching comprehensive solutions to create new economic, social, and environmental value to achieve the goals, including through the establishment of a comprehensive and sustainable forestry industry that utilises every aspect of the town's forest resources; increasing self-sufficiency in local energy using forest biomass; and developing communities responding to the super-aging society. Shimokawa Town achieved about 50% energy self-sufficiency in 2016.¹¹⁸



Photo from NPO Forest Life

● **UK:** In England, there has been a trend towards cities developing local actions to promote the circular economy. In June 2017, the **London Waste and Recycling Board** produced a 'Circular Economy Route Map' to help direct activity and introduced programmes to help support circular businesses; the Mayor of London also incorporated circular economy into the city's land use planning policy. **Zero Waste Scotland**¹¹⁹ works in the areas of resource efficiency and circular economy, with an international event organised called the "**Circular Economy Hotspot Scotland**¹²⁰" which aims to showcase Scotland's progressive approach to a circular economy. The **London Waste and Recycling Board** works with London's waste authorities and businesses towards a circular economy.¹²¹

● **US:** The US and partners hosted the Forum on Life-cycle Approaches to Sustainably Manage Materials in Building and Infrastructure Projects in 2018 to advance life-cycle thinking in the built environment. The forum identified key insights and potential actions in the following theme areas: collaboration and partnerships, innovation and research, life-cycle data and tools, telling a better story about sustainable materials approaches, enhancing secondary materials markets, and shifting paradigms.

● **EU:** The **European Green Capital Award**¹²² (EGCA) recognises and rewards local efforts to improve the environment, the economy and the quality of life in cities. The EGCA is given each year to a city that is leading the way in environmentally-friendly urban living, thus acting as a role-model to inspire other cities. The **European Green Leaf Award** caters for smaller cities.

4.3. Public-private partnerships

Public-private partnerships in various areas (textile and plastic) are increasing with diverse formats such as commitments, sharing activities and alliances to promote action on RE/CE/3R/SMM.

● **France:** In 2016, the French government initiated the “**commitments for green growth**” to strengthen the partnership between the State and leaders of innovative projects in favour of ecological transition and in particular the circular economy. These voluntary agreements lay down the reciprocal commitments between the State and companies. They have a two-fold aim: first, to remove the barriers identified by economic actors, especially those related to innovation for the ecological transition; and second, to promote innovative pioneering projects in the circular economy field so as to ensure dissemination to the entire sector concerned. So far, eight projects have been signed.¹²³

● **Germany:** The **Partnership for Sustainable Textiles** was established to support fair extraction and use of raw materials and more sustainable production of biomass resources in their countries of origin. BMZ also participates in corporate social responsibility (CSR) initiatives operated by German businesses. In addition, **repair cafes** have been promoted in German towns and cities. This is a concept whereby visitors bring their broken items from home, and they can learn how to make repairs from expert volunteers with repair skills in all kinds of fields.⁸

● **Japan: Plastics Smart Campaign**¹⁰¹ has been set up to encourage each and every autonomous entity to engage in whatever initiatives their respective positions allow for and to use plastics in a wise manner, and expand such initiatives through social media. Best practices found in the campaign will be introduced through the channel of the Japan hub of PACE (The Platform for Accelerating the Circular Economy)¹²⁴ at the World Economic Forum. As of March 2019, 446 actions were registered in this campaign from 309 organisations.

● **UK:** The **UK Plastics Pact** is a trailblazing, public-private collaborative initiative that will create a circular economy for plastics, operated by WRAP and the Ellen MacArthur Foundation.¹²⁵ The Pact sets ambitious targets to ensure that by 2025:

▶ 100% of plastic packaging will be reusable, recyclable or compostable.

▶ 70% of plastic packaging will be effectively recycled or composted.

▶ There will be a 30% average recycled content across all plastic packaging.

▶ Action will have been taken to eliminate problematic or unnecessary single-use plastic items through redesign, innovation or alternative (reuse) delivery models.

Defra allocated GBP2.4 million of UK Aid funding for the Platform for Accelerating the Circular Economy (PACE) **Global Plastics Action Partnership (GPAP)** launched by the World Economic Forum in October 2019. The Canadian government also joined the initiative contributing a similar sum. GPAP will help deliver the goals of the **Commonwealth Clean Oceans Alliance (CCOA)** to other countries around the globe. Private sector partners include **Pepsico, Coca-Cola Dow Chemicals and Nestle**.

● **US:** In 2017, the US Department of Energy established the **Reduced Embodied energy & Decreasing Emissions Institute**, a public-private partnership led by the Sustainable Manufacturers Innovation Alliance. REMADE will leverage up to USD70 million in federal funding, subject to appropriations, and will be matched by USD70 million in private cost-share commitments from over 100 partners. The REMADE Institute focuses on reducing the cost of technologies needed to reuse, recycle and remanufacture materials such as metals, fibers, polymers and electronic waste. By enabling recycling and reuse, the Institute will dramatically reduce the energy intensive processes of extracting raw materials and manufacturing the products and improving overall manufacturing efficiencies.¹²⁶



4.4. International / regional cooperation

Alliance members have facilitated various types of international/regional cooperation such as funding to international organisations and international initiatives, establishing international/regional forums or alliances to discuss and share information on RE/CE/3R/SMM including this G7 Alliance. Members also engage in programme and project development for neighbouring or developing countries. In addition, various proactive regional initiatives have been established.

- **Canada: In 2018**, Canada committed to provide **CAD100 million in funding to address plastics waste**, including:

- CAD65 million through the World Bank for an international fund to address plastic waste in developing countries;

- CAD20 million to spark innovation to beat plastic pollution in developing countries; and

- CAD6 million for innovative private-public partnerships through the World Economic Forum Global Plastics Action Partnership.

- **France:** The French Development Agency (AFD), the KfW Group, on behalf of the German Federal Government and the European Investment Bank (EIB) have launched the **“Clean Oceans” initiative** to support the development and implementation of projects that will reduce ocean pollution over the next five years. This EUR2 billion partnership will provide long term funding for projects to reduce marine litter, particularly plastics as well as untreated wastewater discharges, with a view to attracting private sector investment.¹²⁷

- **Germany: European Resources Forum (ERF)** is a knowledge exchange platform on sustainable resource use among policymakers, scientists and key industrial players¹⁰ (EEA 2016). German Environment Agency organised the 4th ERF in Berlin in November 2018, and about 380 people from 45 countries participated.¹²⁸ In addition, the **G7 Alliance for Resource Efficiency** was launched as a permanent forum for exchange on best practices.

- **Italy:** The Italian Ministry for the Environment, Land and Sea (IMELS) is **engaged in several initiatives for the promotion of Global Resource Efficiency at the international level**, including: Supporting Supply System in Rural Areas of Somali and Afar Regional States of Ethiopia (2018); Nearly Zero Emission Sustainable Building in the University of Djibuti (2018); and the Sino-Italian Centre for Sustainability (SICES) with Tongji University, Shanghai, the Sino-Italian Capacity Building Programme on several topics of environmental management and sustainable development, such as industry energy efficiency management¹²⁹ and the DECOR project (Plan intégré de Gestion des Déchets solides aux COMores - Integrated Management Plan for Solid Waste in Comoros Islands - IMELS with a contribution of EUR1,424,600).

The latter aims to build an integrated urban solid waste management system and to develop a national model based on the circular economy paradigm, in which waste will be treated as an economic resource, creating a system that enhances recovery and recycling of materials.¹³⁰

- **Japan:** Japan established the **Regional 3R Forum in Asia and the Pacific**¹³¹ in November 2009, with the objective of providing strategic policy advice to national government authorities to ensure mainstreaming of the 3Rs in overall policy, planning and development. The forum has been **held annually**, with the 9th Forum held in Bangkok in March 2019. **African Clean Cities Platform (ACCP)** is a platform to share knowledge and promote the SDGs on waste management in Africa.

- **UK:** Key initiatives include:

- ▶ The **Commonwealth Clean Oceans Alliance (CCOA)** drives ambitious action to reduce plastic pollution in our oceans. It calls on other countries to pledge action on plastics, be this by a ban on microbeads, a commitment to cutting down on single use plastic bags, or other steps to eliminate avoidable plastic waste.

- ▶ These ambitions are supported by a funding package of up to GBP70 million to boost global research and help countries across the Commonwealth develop sustainable manufacturing and stop plastic pollution from entering the ocean in the first place. The Technical Assistance part of the alliance is to be increased from GBP5m to up to GBP10 million.

- ▶ Twenty five countries, over one third of the Commonwealth, have pledged their commitments and are members of the CCOA.

- ▶ The UK is also a signatory to the Ellen MacArthur Fund New Plastics Economy Global Commitment, which aims to tackle the problem of plastic waste, with a particular focus on packaging.

- ▶ Under the G7's Bologna Roadmap the UK has committed to organising a G7 workshop on resource efficiency indicators and improving data and metrics. The workshop will offer an opportunity to continue to develop our joint capability to measure and monitor resource efficiency outcomes, without which we are unable to progress action at the top of the waste hierarchy.

● **US:**

- The **North American Commission for Environmental Cooperation (CEC)** developed a method to improve the measurement of food loss and waste (FLW) across the food supply chain, including approaches to correlate food loss and waste prevention, recovery and recycling with associated environmental and socio-economic impacts. The CEC communicated practical measures and activities that facilities, organizations, and governments can take to prevent, recover and recycle FLW across specific segments of the food supply chain. Through an outreach component of the food waste project, the CEC engaged youth to raise awareness of food loss and of waste-prevention, recovery and recycling opportunities and to empower them to take action to reduce food waste at schools and in homes.¹³²

- **The U.S./Mexico Border Waste Program** helps address environmental issues along the 3,000-kilometer US-Mexico border. Every year vehicles are stockpiled along the border when they reach the end of their useful lives. The EPA and Mexico developed an end-of-life vehicle guide to provide the proper training and tools to process discarded vehicles so that hazards can be removed and the remaining components can be recycled.¹³³

● **Regional initiatives:**

- **African Centre for Sustainable Development (2017):** the Italian Minister of the Environment, Land and Sea (IMELS), has signed an agreement with UNDP for EUR7 million in support of commitments by the Italian G7 Presidency on the impact of climate change and environmental degradation, in particular in Africa. In this regard, IMELS has partnered with UNDP as well as the Food and Agricultural Organisation (FAO) in Rome in the establishment of this centre which has been focusing on facilitating the exchange of information on development interventions and initiatives, as well as best practices on climate change, food security, resource efficiency, access to water, clean energy generation in support to the achievement of the SDGs by African countries.

- **North American Initiative on Food Waste Reduction and Recovery:** studies the food waste problem in North America and recommends solutions, including approaches that can be taken by industry, commercial and institutional sectors.¹³⁴



- **North American Initiative on Organic Waste Diversion and Processing:** identifies barriers, opportunities and solutions related to increasing organic waste diversion and processing capacity in North America, with a focus on collecting and processing (e.g. composting /digesting).¹³⁵

- **The EU SWITCH to Green Flagship Initiative:** aims at facilitating the transition to an inclusive green economy that generates growth, creates decent jobs, and helps reduce poverty. SWITCH to Green contributes to the implementation of the 2030 Agenda for Sustainable Development, in particular SDG12 on SCP, including the SWITCH regional programmes in Asia, Africa, and the Mediterranean.¹³⁶

- The European Commission organises **Circular Economy Missions**, a series of high-level political and business meetings in third countries to communicate and promote sustainable and resource-efficient policies. These missions aim to strengthen existing ties and create new links between the EU and third country institutions in the field of environment, while supporting green European businesses — especially SMEs — to expand their activities abroad. Past circular economy missions were carried out in Chile, China, South Africa, Colombia, Japan, Indonesia and India. Future missions will be conducted in Mexico (24-25 April 2019) and Singapore and Malaysia (5-12 June 2019).





- The European **Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI)** supports the dialogue on circular economy with about EUR330,000 for the 2.5 year project period from July 2018 to December 2020. The objective of this project is to enhance the EU's dialogue on circular economy with ASEAN, focusing on specific changes in policy and/or legislation on plastics and plastic waste, in particular, single-use plastics. ASEC Environment Division launched the initiative at the Bali Workshop on 'Managing Packaging Waste – Preventing Marine Litter' (31 October / 1 Nov 2018), which brought together about 150 relevant stakeholders.





- A European **Partnership Instrument project on plastic waste and marine litter in East and Southeast Asia** worth EUR9 million will contribute to reducing plastic waste, including marine litter (e.g. fishing gear), via a set of activities in hot spot countries in the region (China, Indonesia, Philippines, Thailand, Viet Nam, Singapore and Japan), including relevant major rivers. These activities will take place in the context of the circular economy concept, and aim to promote the waste hierarchy and extended producer responsibility, address abandoned, lost and otherwise discarded fishing gear, as well as support sustainable plastic production and green public procurement. The project will start in May 2019. It has also been announced in the EU's Plastics Strategy.- Monitoring progress made towards more plastics recycling and more uptake of recycled plastics in Europe. The monitoring should help identify the gaps in the supply and demand for different recycled plastics. In parallel, new voluntary commitments will be encouraged.

5. How Can Actions be Measured? – Monitoring Process

As described in section 2.1, Members have set up monitoring frameworks as well as key indicators and targets, on resource productivity, other material flow and recycling rates etc., in their strategies.

5.1. Targets for RE/CE/3R/SMM

G7	Plans	Key Targets
 Canada	Canada-Wide Waste Reduction Goal	<ul style="list-style-type: none"> relative to the 2014 level, reduce per capital waste disposed <ul style="list-style-type: none"> ▶ 30% by 2030, and ▶ 50% by 2040
	Ocean Plastics Charter / Canada-Wide Zero Plastic Waste Strategy	<ul style="list-style-type: none"> 100% reusable, recyclable, or, where viable alternatives do not exist, recoverable, plastics by 2030 significant reduction in the unnecessary use of single-use plastics increasing recycled content by at least 50% in plastic products where applicable by 2030 recycle and reuse at least 55% of plastic packaging by 2030 and recover 100% of all plastics by 2040
 France	A Roadmap for the Circular Economy ¹³⁷	<ul style="list-style-type: none"> to reduce the material intensity of French consumption (DMC/GDP) by 30% by 2030 compared to 2010 to reduce by 50% the quantities of non-hazardous waste landfilled in 2025 compared to 2010 to progress towards 100% recycled plastics in 2025 to reduce greenhouse gas emissions: (saving the emission of 8 million tonnes of additional CO₂ each year through the recycling of plastic) to create 300 000 additional jobs
 Germany	German Resource Efficiency Program II – Programme for the sustainable use and conservation of natural resources (ProgRes) ⁸	<p>Economic:</p> <ul style="list-style-type: none"> Continuous improvement in the resource efficiency of domestic production <ul style="list-style-type: none"> ▶ Doubling of raw material productivity by 2020 (relative to 1994) Continuous improvement in resource efficiency, including biotic resources and making adequate allowance for imports <ul style="list-style-type: none"> ▶ Trend from 2000 to 2010 to be sustained to 2030 <p>Recycling and recovery:</p> <ul style="list-style-type: none"> Increase in the recycling rate of municipal solid waste <ul style="list-style-type: none"> ▶ Permanent increase in the recycling rate of municipal solid waste to over 65% from 2020 Increase in the recycling of plastic waste (from which harmful substances have been removed) <ul style="list-style-type: none"> ▶ Significant increase in recycling rate by 2020 Increase in the use of recycled construction materials – recycled aggregates as concrete aggregate <ul style="list-style-type: none"> ▶ Significant increase by 2030 Increase in the high-quality use of recycled construction materials – separation of gypsum from construction and demolition waste and establishment of recycling <ul style="list-style-type: none"> ▶ Significant increase by 2030 Improvement of end-of-life vehicle recycling – separation of automotive electronic components (primarily circuit boards and rare earth magnets) from end-of-life vehicles before shredding <ul style="list-style-type: none"> ▶ Largest possible proportion of auto motive electronics removed from each end-of-life vehicle by 2020 Increase in collection and recycling of waste electrical and electronic equipment (WEEE) <ul style="list-style-type: none"> ▶ Permanent increase in the collection rate: collection rate must be at least 65% from 2019 Increase in collection and recycling/recovery of organic waste <ul style="list-style-type: none"> ▶ 50% increase in the quantity of separately collected organic waste and high-quality recycling/recovery of such waste – primarily cascading use – by 2020 relative to 2010 Increase in the recovery of economically usable phosphorus from secondary sources <ul style="list-style-type: none"> ▶ Significant increase no later than ten years after entry into force of the new Sewage Sludge Ordinance <p>Recycling and recovery indicators (in development):</p> <ul style="list-style-type: none"> Reduction in the primary material requirement (including for imported products) by the use of secondary raw materials (from which harmful substances have been removed) Reduction in the primary material requirement (including for imports of raw materials used abroad) by the use of secondary raw materials (from which harmful substances have been removed)
 Italy	Sustainable development strategy/National plan for sustainable production and consumption/ Waste Package 2018 ⁴	<ul style="list-style-type: none"> National SDGs indicators under development 100% of the public purchases to match ecological requirements; <p>EU/IT Recycling targets:</p> <ul style="list-style-type: none"> 1) Municipal Waste : 55% by 2025 / 60% by 2030 / 65% by 2035 2) Maximum 10% of Municipal waste in landfill by 2030 3) All Packaging: 65% by 2025 / 70% by 2030 (plastic packaging waste: 50% by 2025 and 55% by 2030; respectively 25% and 30% for wood; 70% at 2025 and 80% by 2030 for ferrous metals; 50% by 2025 and 60% by 2030 for aluminum packaging; 70% by 2025 and 75% by 2030 for glass; 75% by 2025 and 85% by 2030 for paper and cardboard) <p>National plastic bans: Ban on plastic bags non-biodegradable/non-compostable; Ban on plastic cotton buds by 2019; ban on plastic microbeads in cosmetics by 2020</p>

G7	Plans	Key Targets
<p>Japan</p> 	<p>The 4th Fundamental Plan for Establishing a Sound Material Cycle Society¹²</p>	<ul style="list-style-type: none"> • to achieve resource productivity (= GDP/ input of natural resources, etc.) of JPY490,000/ton by FY2025 (approx. double from FY2000) • to achieve a cyclical use rate (inflow) (= amount of cyclical use / (amount of cyclical use + input of natural resources, etc.)) of 18% by FY2025 (approx. 89% increase from FY2000) • to achieve a cyclical use rate (outflow) (= amount of cyclical use/ generation of waste, etc.) of 47% by FY2025 (approx. 30% increase from FY2000) • to achieve a final disposal amount of 13 million ton by FY2025 (approx. 77% cut from FY2000) • by FY2025, double the market size of business related to Sound-Material-Cycle Society from FY2000
<p>UK</p> 	<p>Our Waste, Our Resources: A Strategy for England (Chapter 8)¹³⁸</p>	<ul style="list-style-type: none"> • Double resource productivity by 2050 • Eliminate avoidable waste of all kinds by 2050 <ul style="list-style-type: none"> ▶ Achieve 50% recycling rate for household waste by 2020 ▶ Achieve 65% recycling rate for municipal solid waste by 2035 ▶ Achieve 75% recycling rate for packaging by 2030 • Eliminate avoidable plastic waste over the lifetime of the 25 Year Environment Plan • SDG 12.3 target – halve global food waste at consumer and retail levels by 2030 <ul style="list-style-type: none"> ▶ Work towards eliminating food waste to landfill by 2030 ▶ Municipal waste to landfill 10% or less by 2035 • Work towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025 • Developing impact-based metrics
<p>US</p> 	<p>SMM Program Strategic Plan 2017-2022¹³⁹ (Anticipated Outcomes by 2022)</p>	<ol style="list-style-type: none"> 1. Incorporate lifecycle SMM concepts into the built environment marketplace. <ul style="list-style-type: none"> • Increase safe reuse and recycling of C&D materials • Increase the safe beneficial use of high priority industrial byproduct materials 2. Promote opportunities across the entire food life cycle to reduce wasted food from landfills, with a preference for those approaches higher up on EPA's food recovery hierarchy <ul style="list-style-type: none"> • Make progress towards the US goal of a 50% reduction in food loss and waste by 2030 by decreasing the amount of wasted food from retail to consumer, as well as the amount of food waste ultimately disposed of in landfills 3. Sustainable Packaging <ul style="list-style-type: none"> • Increase per capita quantity of recyclables collected • Increase yield rates of recyclables collected, processed and made available to the secondary materials market (quality) • Increase average household lbs/year of recyclables collected; and • Increase access to and participation in recycling collection
<p>EU</p> 	<p>EU Action Plan for the Circular Economy¹⁵</p>	<ul style="list-style-type: none"> • A common EU target for recycling 65% of municipal waste by 2035 • A common EU target for recycling 70% of packaging waste by 2030 • A binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030 • A ban on landfilling of separately collected waste • Promotion of economic instruments to discourage landfilling • Simplified and improved definitions and harmonized calculation methods for recycling rates throughout the EU • Concrete measures to promote re-use and stimulate industrial symbiosis - turning one industry's by-product into another industry's raw material • Economic incentives for producers to put greener products on the market and support recovery and recycling schemes (e.g. for packaging, batteries, electric and electronic equipment, vehicles)

5.2. Indicators and Monitoring frameworks

The following G7 members are setting up a monitoring framework and/or system on RE/CE/3R/SMM actions. Some examples are listed below:

● **Canada:** the **Canadian Environmental Sustainability Indicators**¹⁴⁰ monitor resource flows and consumption for water, fish stocks, forestry sector, etc. as well as the environmental impacts related to the agricultural sector, mining, pulp and paper, and automobile fleet. Quantities of recycled material (e.g., paper, e-waste, construction waste, etc.) and trade in secondary material are also measured by Statistic Canada.

● **France:** France uses 10 key indicators, including: 1) “sustainable production” such as domestic material consumption per capita; resource productivity; number of ecolabel holders; and number of industrial symbiosis projects; 2) “sustainable consumption” such as car-sharing; food waste; and household spending on product repair and maintenance; and 3) “waste management” such as quantities of waste sent to landfill; and use of recycled raw materials in production processes.¹⁴¹

● **Italy:** In 2018 the Ministry of Environment, the Ministry of Economic Development and the National Agency for new technologies, energy and sustainable development have elaborated a **monitoring framework for resource efficiency and circular economy at macro-meso and micro level**.¹⁴² The public consultation ended on 31 October 2018 and a final report was issued in December 2018. Moreover, the Circular Economy network has published a report on the performance of Italy on CE

● **Japan:** Under the Fundamental Plan for a Sound Material-Cycle Society, in addition to indicators with targets, the Japanese government has set up an **indicator framework with several monitoring indicators**.¹² Those indicators include: material flow indicators and numerical targets to grasp the overall picture of the sound material-cycle society; material flow indicators to monitor the level of material flow improvement as a result of measures taken by each stakeholder; and indicators to monitor the progress of each measure underlined in the above Fundamental Plan, including the amount of food loss from households and business activities.

● **UK: A suite of indicators has been developed** to measure progress against the Strategy’s objectives. These include, but are not limited to, indicators on resource productivity, GHG emissions from waste and raw material consumption. Plans are also being developed to host a workshop on metrics following a UK commitment under the Bologna Roadmap.

● **US:**
- Under the SMM Program Strategic Plan 2017-2022, work will be conducted in the area of Sustainable Electronics Management

(e.g., SMM Electronics Challenge and National Strategy for Electronics Stewardship). There are lifecycle assessment (LCA) efforts involving the development of tools, **SMM indicators and work to develop a Federal LCA Commons** (a network of interoperable data, databases and models that facilitate the ability to conduct LCAs). In addition, SMM international efforts and overarching measurement and analysis that support the SMM Program will continue.¹⁴³

- Each year, the EPA produces a report called **Advancing Sustainable Materials Management: Fact Sheet**, formerly called Municipal Solid Waste in the United States: Facts and Figures. It includes information on municipal solid waste (MSW) generation, recycling, combustion with energy recovery and landfilling. The fact sheet also includes information on Construction and Demolition Debris generation, which is outside of the scope of MSW. The EPA uses this information to measure the success of materials management programmes across the country and to characterise the national waste stream.¹⁴⁴

- The EPA convenes the **State Measurement Program (SMP)**, an online reporting, information sharing, and measurement tool that allows U.S. states to share a wide range of information including annual tonnage data (waste, recycling and composting, etc.), descriptions of the types of waste and recycling programs in the state, and financial summaries of how the programmes are staffed and funded. After the annual data sharing, a series of analytical reports are generated that summarise, aggregate and present the information on a state, regional and national level.¹⁴⁵

● **EU:** The **Monitoring Framework on progress for the circular economy** at EU and national level is composed of a set of ten key indicators which cover each phase (i.e. production, consumption, waste management and secondary raw materials), as well as economic aspects (investments and jobs, and innovation). The Framework includes the indicators: EU self-sufficiency for raw materials; green public procurement; waste generation; food waste; overall recycling rates; recycling rates for specific waste streams; contribution of recycled materials to raw materials demand; trade in recyclable raw materials; private investments, jobs and gross value added in selected circular economy sectors; and patents related to waste management and recycling.^{146,147,148}

Since 2013 the European Commission has produced a resource efficiency scoreboard to measure progress towards resource efficiency. The scoreboard includes a lead indicator on resource productivity, a dashboard of indicators on materials, land, water and carbon, and thematic indicators on transforming the economy, nature and ecosystems, and key areas (food, buildings and mobility).¹⁴⁹

6. Towards further actions and concerted efforts

The world still faces the challenge of unsustainable consumption and production patterns. As stated in the resolution at UNEA4, the global community seeks 'innovative pathways to achieve sustainable consumption and production' for which RE/CE/3R/SMM improvement is crucial.

This synthesis report demonstrates actions and practices in policy areas set out in the Toyama Framework on Material Cycles and the 5-year Bologna Roadmap by the members of the G7 Alliance. Actions listed in this report are non-exhaustive but represent recent actions and some good practices in member countries, and all members have explicitly made significant efforts on RE/CE/3R/SMM to achieve a resource-efficient future, responding to the Toyama Framework on Material Cycles and the 5-year Bologna Roadmap.

All alliance members have developed their own strategies as a solid policy base for action, and have established monitoring indicators and set targets for the strategies and policies including for resource productivity, material flow and recycling rates. Actions on plastics and food as well as application of EPR has been actively carried out. There has been an increase not only in policy activities, but in public private partnerships as well as several private sector initiatives especially on plastics. Many cities/local governments have established their own distinct systems. Unique local activities are emerging. Governmental support, including financing, plays an important role to further promote best practices for both the private sector and local government. Furthermore, members have implemented proactive international/regional cooperation, initiatives and projects for non-G7 countries.

Through the RE/CE/3R/SMM actions shown in the report, members have addressed interlinkages between resource efficiency and economic, social and other environmental issues. These have been emphasised in the G7 Environment Ministers' Meetings as well as in the IRP report and OECD guidance, which were invited to be produced at the G7 Summit Schloss Elmau in 2015. In the communiqué at the latest G7 Environment

Ministers' Meeting in Metz, France, resource efficiency policies were described as "a key part of a sustainable, low emission global economy that conserves, restores, and sustainably uses natural resources, while offering economic opportunities such as competitiveness, secure supply, innovation, economic growth and job creation." The IRP report³ and in the OECD policy guidance⁴ often discusses in the conclusions and recommendations 1) integration with economic policy and low-carbon policies including system approach, 2) investment and financing, 3) addressing social issues associated with transition 4) data, indicator and target and 5) concerted efforts and collaboration.

The Alliance will also continue to collaborate with various actors such as private actors, local governments and the wider global community to address multi-dimensional issues through RE/CE/3R/SMM towards sustainable development; and to share good practices and follow up progress through the alliance workshops and other actions. This was also emphasised at the latest G7 Environment Ministers' Meeting in Metz, France where Ministers "strongly urge continued dialogue of sharing and promoting best practices together with the active participation of business and relevant stakeholders, and recognize the role of the G7 Alliance on Resource Efficiency and the G20 Resource Efficiency Dialogue in that respect." Furthermore, commitment to implement the Toyama Framework on Material Cycles and the 5-year Bologna Roadmap as frameworks on resource efficiency is reaffirmed and progress of the G7 members, including this follow-up activity is welcomed by the G7 Environmental Ministers.

The actions and concerted efforts by the members of G7 Alliance on Resource Efficiency will continue to be further developed and elaborated. The Alliance also hopes that this follow-up report will contribute to facilitating global, regional and national discussion for RE/CE/3R/SMM, providing informative references to all stakeholders not only G7 but also non-G7 countries as well as various stakeholders.

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- Note: actions without reference were provided as inputs from the alliance members

“Our Actions for a Resource-efficient Future: Following Up G7 Progress on Toyama Framework on Material Cycles and 5-year Bologna Roadmap” is downloadable on the Resource Efficiency and Circular Economy page on the IGES website (<https://www.iges.or.jp/en/circular-economy/index.html>).

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