

речовин від автотранспортного потоку дозволив встановити суттєвий рівень впливу автотранспортного потоку, який рухається по досліджуваній ділянці, на якість атмосферного повітря, оскільки встановлено перевищення граничнодопустимих концентрацій на всій ділянці автомобільної дороги.

За результатами дослідження було розроблено наступні природоохоронні заходи щодо зменшення рівня забруднення атмосферного повітря у зоні впливу досліджуваної ділянки автомобільної дороги:

- заборона паркування вздовж вулиць;
- вивід з міста транзитного транспорту;
- виділення смуг громадського транспорту;
- оптимізація руху міського транспорту;

– створення безперервного руху автомобільного потоку з метою зменшення утворення черг при заборонному сигналі світлофору.

CIRCULAR ECONOMY IN GERMANY

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Germany continues to consume too many raw materials and fails to retain them in the economic cycle sufficiently. In 2015, the country's „material footprint“, i.e. the sum of all raw materials required to manufacture the products and goods used domestically, was 22.6 tonnes per inhabitant. This was almost twice as high as the global average of around 12 tonnes. High consumption of materials has negative environmental impacts throughout the entire life cycle of the products and goods manufactured from them: the extraction of raw materials already generates social, environmental and health problems, as many of the countries where they are produced do not have stringent environmental or social standards. The processing of raw materials is responsible for up to 30 % of global greenhouse gas emissions. The use of the products manufactured also frequently consumes energy and can lead to the release of harmful substances into the environment. After their use, products have to be recycled or disposed of as waste. This again generates emissions, consumes energy and requires landfill space and sometimes additional raw materials.

„Business as usual“ is not an acceptable option from the SRU's point of view. The only viable way forward is a genuine circular economy that reduces the overall use of raw materials and retains materials in the economic cycle as long as possible. To achieve this, politics and society must pay much more attention to the circular economy and give

much more weight to the high potential for reduction of material use and re-use and recycling.

At first glance, the circular economy is nothing new for Germany. The Circular Economy Act of 2012 defines the term as „the prevention and recycling of waste“. In practice, a „waste management system oriented towards circular material flows“ has been established with a strong focus on cost-effective recycling and safe forms of other recovery (e.g. energy recovery) and disposal. This pays particular attention to the last phase of a product’s life, but not to the entire life cycle of a product or to the reduction of material flows in general. However, this is too short-term an approach, because waste recycling and the subsequent substitution of primary raw materials by secondary raw materials contribute comparatively little to reducing the overall use of raw materials and the resulting environmental impacts.

This can be seen, for example, in the material flow of plastics. The use of plastics is continuously increasing in Germany. In packaging, it almost doubled between 1991 and 2017. In 2017, 6.2 million tonnes of plastics were collected as waste. Only a small percentage of this amount is actually used again as secondary raw material in the manufacture of high-quality plastic products.

The following strategic approaches are key to ensuring that policy for a circular economy becomes part of a precautionary environmental policy:

1. The input of raw materials into products, infrastructure and services must be reduced. The SRU recommends the establishment of a national raw materials inventory, on the basis of which it will be possible to identify those material flows that most urgently need to be reduced from an environmental perspective. In addition, the total raw material productivity indicator as set out in the sustainability strategy should be supplemented by a consumption indicator (RMC) and broken down by type of raw material.

2. Primary raw materials must be given an „ecological true-cost pricing“, meaning one that internalises external environmental costs. The German government should make efforts to ensure that social and environmental standards are applied in countries producing raw materials, and that these are reflected in prices. Economic instruments such as CO2 pricing or a raw materials tax represent additional possible steps.

3. Measures to promote the circular economy should have a stronger ecological focus rather than a primarily economic one. This orientation should be systematically embedded within programmes and supported by instruments for evaluating the ecological effectiveness of measures.

4. Waste prevention must be strengthened, and the service life of products extended. The Federal Government should work at EU level to ensure that the Ecodesign Directive is extended and specified to cover additional product groups. Requirements regarding durability, reparability and recyclability should be developed quickly and made mandatory.

5. Existing producer responsibility must be advanced for the management of electronic waste, waste batteries, end-of-life vehicles and packaging waste. There must be clear rules to ensure that the costs of a circular economy are borne by those responsible for production and are transparently reflected in the price of the product. Additionally, Germany should advocate the principle of producer responsibility at EU level, to ensure compliance with the European internal market and to achieve ecological true-cost pricing. At national level, the Federal Government should look into introducing producer responsibility for furniture and textiles, because both are produced in large quantities, often contain high levels of pollutants and increasingly have only short service lives. As far as possible, products should be free of pollutants in order to simplify materials recycling and to enable the extraction of high-grade, uncontaminated secondary raw materials. Within the framework of future EU product and chemicals policy, lists of approved ingredients should be developed to provide manufacturers with information on ingredients suitable for high-grade recycling.

6. Recycling must be rated not only on the basis of quotas and quantities, but also in terms of its quality. The recycling of products into secondary raw materials must be designed in such a way that it can compete in cost terms with the primary production of raw materials. The SRU recommends the introduction of transparent, advanced recycling fees, especially for end-of-life vehicles and waste electrical and electronic equipment, to enable high levels of dismantling and recycling to be achieved. To facilitate high-grade recycling, recycling quotas should be supplemented by a number of additional requirements. These include, for example, treatment requirements, specified output qualities, and monitoring requirements.

ЩОДО ШУМОВОГО ЗАБРУДНЕННЯ МІСТ АВТОМОБІЛЬНИМ ТРАНСПОРТОМ

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Проблема акустичного забруднення автотранспортом навколишнього середовища, особливо в великих містах, є актуальною у зв'язку з прогресуючим розвитком автомобільного транспорту.

Шум - це безладні коливання різної фізичної природи, що відрізняються складністю тимчасової і спектральної структури. Акустичне забруднення - одна з