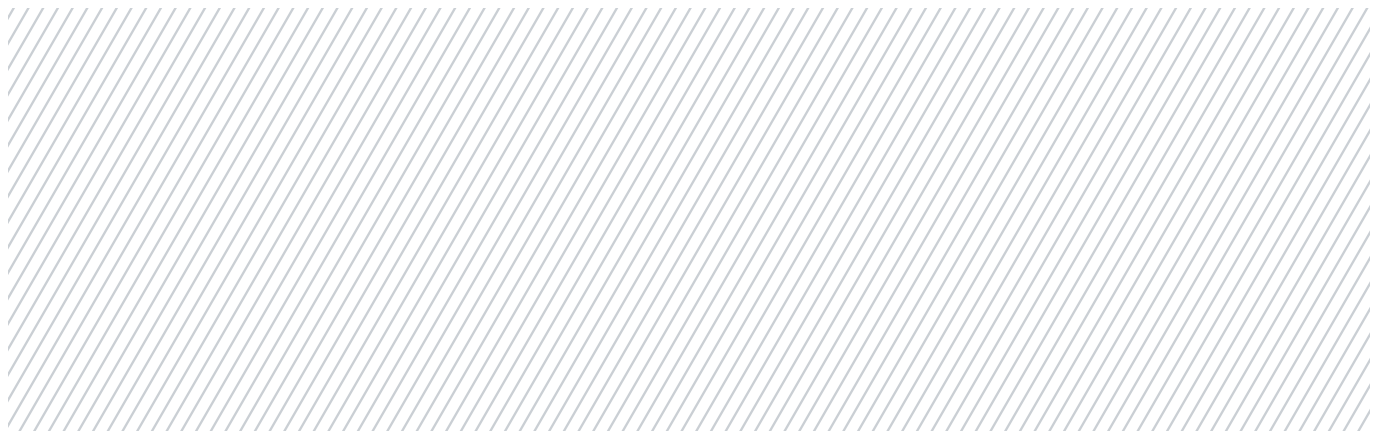


The long and rocky path away from shale oil towards green energy

Climate action in EU Cohesion Policy
funding for Estonia, 2014-2020



Estonia is still among the top three per capita and per GDP GHG emitters in Europe, mainly due to the carbon and energy-intensive oil-shale-based energy sector, rapid growth in road freight transport and car use, low energy efficiency of the new vehicle fleet and high-energy consumption of buildings. Estonia maintains its high carbon intensity by keeping oil shale as a major energy source and the country's shale oil dependency is not at all addressed by EU funds, in spite of the existence of a long-term decarbonisation strategy. Transport funding dedicated to road construction omitting emissions considerations, climate change mitigation in projects selection and horizontal principles are flawed.

In Estonia, the national Europe 2020 targets for energy and climate change are represented by the National Reform Programme (NRP, Eesti 2020) of 2011, updated in 2012⁷⁷. Estonia will allow non-ETS emissions to grow by a maximum of 11% by 2020 compared to 2005 levels, aim for a 25% share of renewable sources in final energy consumption and stabilise final energy consumption at 2010 levels by 2020 (2,818 ktoe).

Energy generation in Estonia is mainly based on domestic fuels, particularly on oil shale, while transport fuels are entirely imported. The volume of oil shale production has not changed over the last decade – 18.7 million tonnes was produced in both 2011 and 2012. The majority of oil shale is consumed in power plants and as raw material for shale oil production. In 2008, 91% of electricity was produced from oil shale, whereas this share dropped to 85% in 2011 and to 81% in 2012. At the same time, consumption of oil shale in the oil industry increased, together with growth in shale oil production. The continued demand for shale oil in Estonia and in external markets increased the production of shale oil by about 7% compared to 2011. Nearly 80% of the shale oil is blended with naphtha fuels and exported.

The oil shale sector provides 4% of Estonia's GDP, but at the same time it is the biggest environmental polluter. Despite oil-shale users meeting the strict environmental norms of industrial emissions of the EU, this sector is responsible for 78% of total annual CO₂ emissions, up to

98% of other emissions to ambient air and 83% of total annual waste generation. CO₂ emissions in 2011 for oil-shale based electricity in Estonia were 1225 tCO₂/GWh. Oil shale mining also has severe impacts on the landscape through opencast strip mining and pollution of ground water due to underground mining. For each tonne of oil shale extracted, about 14 – 18 m³ of water is pumped out and wasted, and ground water is contaminated with phenols and oil residuals over an area of 436 km² of shale mining areas in the north-east of Estonia.

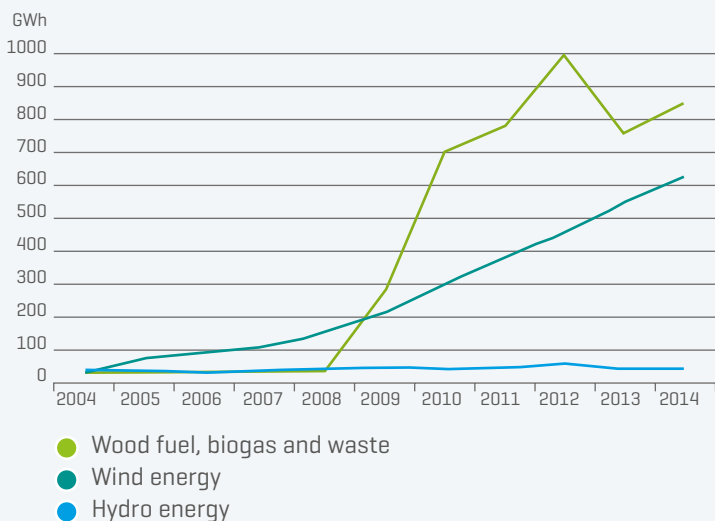
Low efficiency in primary energy use in power generation from oil shale is the main reason for the fact that the energy intensity and CO₂ emissions of the Estonian economy are among the highest in the EU. In 2013, 0.51 tonnes of energy in oil equivalents (toe) was used in Estonia for the production of EUR 1,000 of GDP. The average of the EU was three times smaller (0.14 tonnes) [See Graph 6: 'Energy intensity of the economy 2013'].

In the last decade, production of electricity from renewable sources has increased significantly. In 2008 the share of electricity generated from renewable sources was only 2.1% of total electricity consumption, whereas its share was 12.7% in 2011 and 15.2% in 2012. New wood-fuel-based combined heat and power (CHP) plants have been put into operation, which has increased the share of electricity produced from biomass to two thirds of total renewable electricity production. The production of wind and hydropower energy has also increased year by year. In 2012, the production of both wind and hydro energy increased about 20% compared to 2011. In 2013, the share of renewable energy in final energy consumption was 25.6%, exceeding the national target for 2020. The introduction of renewable sources has slightly reduced the importance of waste-intensive oil shale in electricity production.

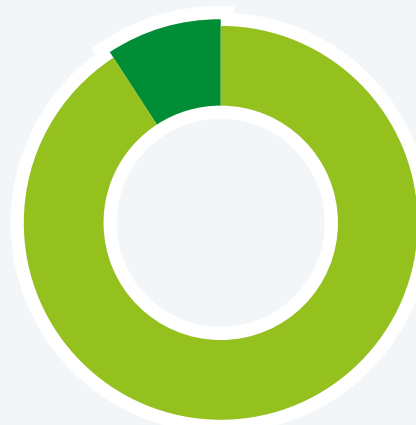
Despite the significant increase in the share of renewables in electricity production, Estonia is far from achieving the goal defined in its national energy strategy to reduce the share of oil shale in power production below 50% of the country's total power production mix by 2020.

77 http://ec.europa.eu/europe2020/pdf/nrp/nrp_estonia_et.pdf

GRAPH 21: Production of electricity from renewable energy sources in Estonia 2002-2012, GWh.



GRAPH 22: Share of fossil fuels in 2013 electricity production.



● 9% Renewable fuels and sources
● 91% Fossil fuels

Source: Estonian Statistics Board electronic database http://pub.stat.ee/px-web.2001/Dialog/varval.asp?ma=KE033&ti=ELEKTRIJAAAMADES+ENERGIA+TOOTMISEKS+TARBITUD+K%DCTUS&path=../Database/Majandus/02Enegeetika/02Energiatarbimine_ja_tootmine/01Aastastatistika/8lang=2

The decarbonisation of electricity production thus plays a key role for achieving a low-carbon economy.

By 2014, non-ETS emissions had decreased by 5%, and Estonia is on track to meet its non-ambitious climate target for 2020. By 2013, Estonia had met its 2020 renewable target of 25%⁷⁸.

The energy efficiency target for the transport sector is set in the Estonian Transport Development Plan 2014 to 2020, which commits to stabilising the transport sector's energy consumption by 2020 at the level of 2012 (33 million TJ) and to create a basis for reducing energy consumption after 2020.

TABLE 6: Estonia's electricity production by source in 2012 and 2013 (GWh).

SOURCE (FUEL)	2012	SHARE OF TOTAL (FUEL)	2013	SHARE OF TOTAL (FUEL)
Total renewables	1 477	12.34%	1 201	9.11%
Incl. Wood	953	7.96%	621	4.71%
Incl. Wind	434	3.63%	529	4.01%
Incl. Hydro	42	0.35%	26	0.20%
Incl. other renewable	48	0.40%	25	0.19%
Total Fossil	10 489	87.66%	11 981	90.89%
Incl. Oil shale	9 699	80.80%	11 388	86.39%
Incl. Oil shale retort gas	511	4.27%	299	2.27%
Incl. Oil shale oil	58	0.48%	134	1.02%
Incl. Natural gas	123	1.03%	89	0.68%
Incl. Peat	98	0.82%	71	0.54%
Incl. Heavy fuel oil	0	0%	0	0%
TOTAL	11 966	100%	13 182	100%

Source: Estonian Statistics Board electronic database

78 http://ec.europa.eu/priorities/energy-union/state-energy-union/docs/estonia-national-factsheet_en.pdf

The national target for final energy consumption is 2,818 ktoe by 2020, but it is likely to be missed if current trends continue: the European Environment Agency⁷⁹ in its latest evaluation states that Estonia is one of two Member States whose primary energy consumption increased between 2005 and 2013. Furthermore, these increases in primary energy consumption were too large to remain below the linear trajectories of 2005 levels to achieve the energy saving 2020 targets. Estonia is still among the top three per capita and per GDP greenhouse gas producers in Europe – mainly due to the carbon and energy-intensive oil shale based energy production sector, rapid growth in road freight transport and car use, low energy efficiency of the new vehicle fleet and high-energy consumption of buildings. The average carbon footprint of Estonian electricity (based on 2010–2012 electricity production data) is 0.92 kgCO₂ per kWh. In total, 19.2 million CO₂ equivalent tonnes of greenhouse gases (carbon dioxide, methane and dinitrogen oxide) were emitted into the atmosphere in 2012 and per capita GHG emission in Estonia was 16.5 tons in 2013⁸⁰. Hence, EU funds should be used to address those inefficient and carbon intensive sectors.

The main policy priorities pointed out in the National Reform Programme 2020 regarding energy include:

- The expansion of co-generation of electricity and heat.
- Reconstruction of oil-shale-fired power plants.
- Increasing the share of renewable energy.
- Establishment of sufficient energy interconnections.
- Conservation of energy in private households.
- Reducing the need for transport.
- Increasing use of public transport.
- Increasing the fuel efficiency of vehicles.
- Development of an intelligent power grid.
- Development of energy and resource efficiency of companies outside the ETS.
- Support for R&D in resource efficiency and eco-innovation investments.
- Reduction of waste generation and increasing recycling.
- Enhancing the value of biomass in Estonia, including developing the production of bio-methane for transport fuel.

Whereas this list of measures reads well from a sustainability point of view, the main policy measures of the National Reform Programme 2020 do not coherently prioritise tackling the inefficiency and dependency of the power sector on oil shale.

Apart from EU and national budgets, many of the above measures are funded through Green Investment Schemes – for example, the refurbishment of public buildings and private houses, the electro-mobility programme and renewal of the public transport fleet are eligible under EU funds, but also have additional financing sources.

Estonia is currently working on updating several national strategies and action plans of climate relevance: The National Transport Strategy 2014–2020 was approved in 2014; the National Energy Strategy 2015–2030 is waiting for approval by Parliament at the time of writing; the Bio Economy Action Plan 2014–2030 and the National Oil-shale use plan 2015–2030 are also soon to be approved by Parliament. The National Energy Strategy includes scenario analyses up to 2050, but still none of the new strategy documents foresee sufficient action to achieve decarbonisation goals in the long-term. Estonia has transposed most of the relevant EU Directives and Decisions through a number of legal acts, and the country is currently updating the necessary plans and measures for different sectors like energy efficiency, renewable energy, transport, climate risk prevention, nature conservation, bio energy, rural development, and forestry and fisheries development. However, there are no valid national or sector-specific strategies and action plans on climate change mitigation and adaptation⁸¹. The Estonian Ministry of Environment has carried out a background study on Opportunities for a Low-Carbon Economy (Estonian Low Carbon Road Map 2050) comparing different development scenarios. Also, a National Climate Change Adaptation Strategy 2016–2100 is under development and preparation of the National Climate Policy until 2050 has been started - both long-term policy documents due to be adopted in 2016.



79 EEA: Trends and projections in Europe 2015 — tracking progress towards Europe’s climate and energy targets, <http://www.eea.europa.eu/>
 80 http://ec.europa.eu/priorities/energy-union/state-energy-union/docs/estonia-national-factsheet_en.pdf
 81 Climate issues are incorporated mainly in the Estonian Environmental Strategy 2030, National Reform Programme 2020, National Development Plan for Energy Sector until 2020, National Renewable Energy Action Plan 2020, National Waste Management Plan, Water Management Plans, Forestry Development Plan until 2020, Nature Conservation Development Plan 2020 and National Transport Development Plan 2014 to 2020



CLIMATE ACTION: THE CASE FOR EU FUNDS?

The GHG emissions reduction potential of the Estonian energy sector is high due to the considerable share of oil shale in today's energy mix. By implementing appropriate policy measures and following the development path as described in the Estonian Low-Carbon Roadmap 2050, Estonia's energy sector emissions could be reduced by 90% by 2050 compared to the 1990 level. Unfortunately, none of the targets in the valid national sector strategies is aiming to follow that goal, nor do the strategies propose relevant tangible action.

In order to achieve low-carbon electricity production, the Government has to phase out subsidies and preferential treatment of oil shale users. EU funds should be used to catalyse the transition by supporting the replacement of fossil fuels in existing power plants with renewable energy, by supporting electricity and heat cogeneration in small cities and in industry as well distributed and micro generation by individual consumers.

In that context, private investments into renewable generation capacities could be promoted via EU funds by supporting the foundation of energy cooperatives for small-scale power

production. Solar panels have to become standard as part of building construction as well as the construction of solar parks in rural areas with government support - all potentially eligible actions for EU funds. In order to facilitate large-scale replacement of oil-shale in the national power mix and concentrated (and thus inefficient and vulnerable) generation with distributed generation, investment into grid development allowing wider uptake of domestic renewable resources (for example, wind power on the west coast and islands) and interconnections are necessary. Together with enhanced development of renewables-based distributed generation, support for renovation of buildings in both public and private sectors has to be doubled from the current support level, in order to achieve a significant shift of the energy performance of buildings. However, the currently proposed renovation rate falls short by half on this particular target. Energy audits and ESCO services have to be mainstreamed together with strengthening regulation of the energy performance of buildings, machinery and appliances. All these above measures outlined in the Estonian Low-Carbon Roadmap 2050 are perfectly eligible under the Cohesion Policy 2014-2020, and their long-term investment perspective is undisputed. But is this translated into action?





WEAK CLIMATE GOALS IN THE PARTNERSHIP AGREEMENT AND OPERATIONAL PROGRAMMES FOR 2014-2020

One of the five national objectives for the funding period 2014-2020 carries the headline 'A clean and diverse natural environment and efficient use of natural resources'. In terms of investment areas, it lists renewable energy use (sustainable use of biomass and wind), high-efficiency combined heat and power generation and sustainable transport policies (rail, public transport, non-motorised transport, ports) both at urban and regional level; and investments in smart grids are stated as of the highest importance to European Regional Development Fund (ERDF) and Cohesion Fund (CF) planning. The focus of EU funds spending is stated by the authorities to be on priorities like research and innovation (R&I), support to small and medium-sized enterprises (SMEs), quality education and training, inclusive labour markets fostering quality employment and social cohesion, delivering the highest productivity gains, and last but not least, mainstreaming of climate change objectives and shifting to a resource-efficient low-carbon economy.

THE ESTONIAN PARTNERSHIP AGREEMENT: TURNING A BLIND EYE TO ENERGY TRANSITION

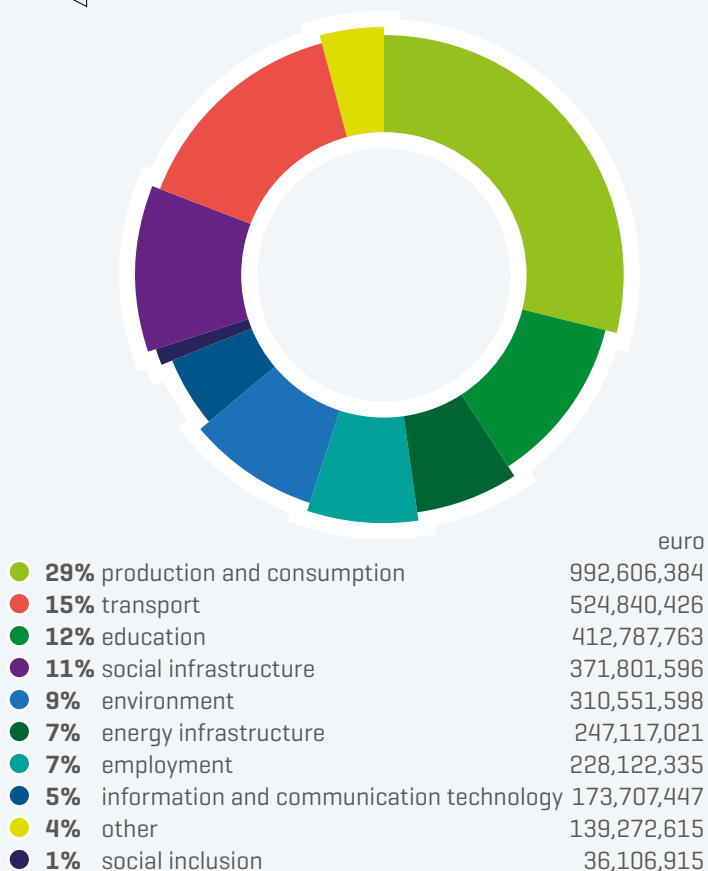
Whereas climate mainstreaming requires the integration of climate change considerations horizontally throughout

all spending areas, the Partnership Agreement addresses climate change mitigation issues in three priority axes out of eight: 'Knowledge intensive and internationally competitive economy', 'Clean and diverse environment and efficient use of natural resources' and 'Sustainable connections and mobility which satisfies needs of inhabitants and supports the economy'. GHG emissions should be reduced by supporting actions aimed at energy and resource efficiency, shift of technologies and innovation, increasing the share of public transport, and reducing the need for mobility by better planning of urban territories.

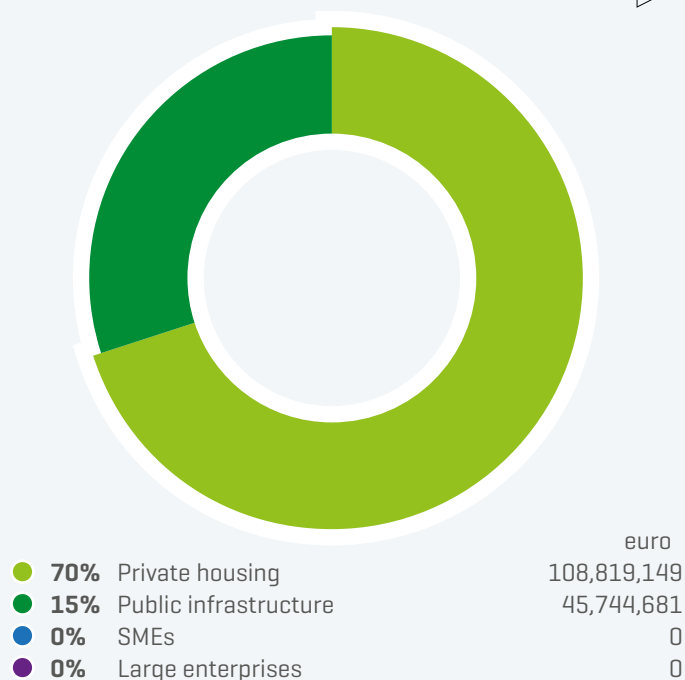
So far, so good. But the national priorities for EU funding as elaborated in the Partnership Agreement do not address sufficiently the main issues of the Estonian energy sector when it comes to fighting climate change – namely the high dependency on fossil fuels in the energy and transport sectors and inefficient power production.

The Partnership Agreement declares that Estonia strives to combine economic growth with the improvement of the environment. For each of the EU funds there is a specific focus on sustainability. The European Regional Development Fund focuses on resource efficiency, innovation and the

GRAPH 23: Investment areas of Cohesion Policy funds in Estonia. Source: our own calculations based on approved Operational Programmes according to categories of intervention



GRAPH 24: Energy efficiency allocations according to type of beneficiary. Source: our own calculations based on approved Operational Programmes according to categories of intervention



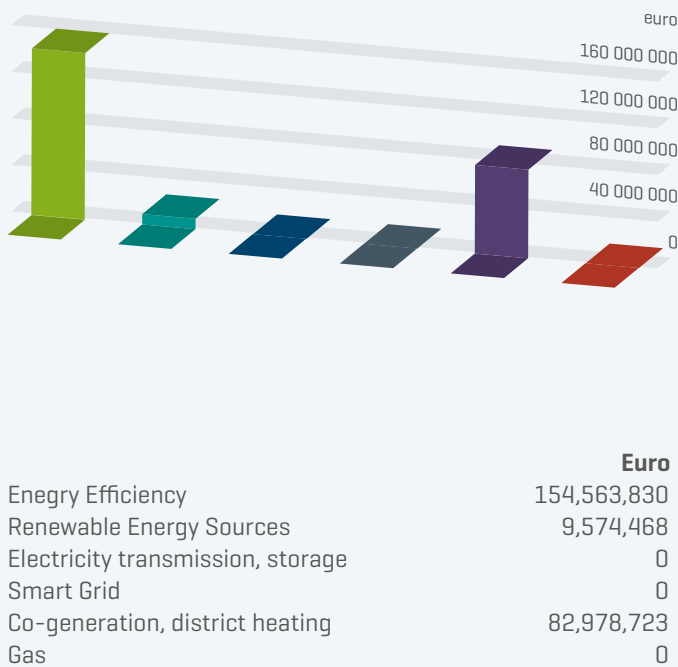
transformation to a low carbon economy. The European Social Fund has the least focus on sustainability, though, with quite a potential for the creation of ‘green jobs’ aiming at education for improved energy saving and protection of the environment.

When it comes to describing the objectives and priorities, as well as the important horizontal themes that should be taken into account when developing interventions, the Estonian Partnership Agreement states that ‘Climate related issues are considered as cross-cutting through all sectors’; and that ‘Environment protection and climate are determined as horizontal issues for planning of ESIF according to the Government decision from 21.06.2013’. Further on, however, the description of the implementation and monitoring measures leaves open how the above objectives will be met.

The estimated expenditure for climate-related actions of all the European Structural and Investment Funds (ESIF) for Estonia, i.e., the three Cohesion Policy funds plus rural development and fisheries amounts to 18.7% of the total indicative ESIF budget, EUR 815,010,532. Climate action in Cohesion Policy amounts to EUR 548,226,064, 16.01% for the ‘low-carbon objectives’, and investments into energy efficiency, renewables and electricity distribution and storage add up to only EUR 164,138,298 or 4.78% of all Cohesion Policy funding, a rather modest share compared to other countries in the region (see Graph 5). In addition to Estonia’s total climate action, some EUR 76,522,973 (out of a total EUR 193,382,433) from the Connecting Europe Facility (CEF) are counted towards the overall EU budget climate goal of 20%, co-financing the construction of a new high-speed railway connection ‘Rail Baltic’, the Baltic Connector gas pipeline and new transmission lines to Latvia.

CLEAN ENERGY FINANCING UNDER THE 'INVESTMENT FOR GROWTH AND JOBS' GOAL: TOO LITTLE TO MAKE A DIFFERENCE

GRAPH 25: Different types of energy infrastructure investments; source: our own calculations based on approved Operational Programmes according to categories of intervention



There are three national operational programmes (OP) in Estonia to cover all European Structural and Investment Funds for the period 2014-2020 and one OP for cross-border cooperation between Estonia and Latvia. The Estonian OP under the 'investment for growth and jobs' goal lays down the conditions for the European Regional Development Fund Cohesion Fund and European Social Fund.

Climate change mitigation objectives are addressed in six out of thirteen non-technical Priority Axes: Priority Axes 6 (Energy Efficiency) and 10 (Sustainable Transport) directly address mitigation and Priority Axes 4 (Growth Capable Entrepreneurship), 7 (Water Protection), 8 (Green Infrastructure and Improved Preparedness for Emergencies) and 9 (Sustainable Urban Development) do so indirectly. The measures proposed include energy efficiency in public buildings and street lighting for using LED technologies, renovation of the housing stock of housing cooperatives in houses built before 1993 and renovation of district heating pipes.

The interventions (Graph 24) are supposed to result in 1,700,000 m² of housing stock renovated, 22,000 street lights replaced with LED lamps, 40,000 households with improved energy efficiency classification and thus a decrease of 40,000 tonnes of CO₂ emissions annually. Project selection for housing renovation support requires energy audits. Given the high-energy intensity of the Estonian economy, it is striking that there is no support foreseen for energy efficiency measures in SMEs, for example, via preferential loans or other financial instruments which could boost SMEs' energy and resource efficiency for the long-term. However the expected 1.7 million m² of housing stock renovation rather equals a 'business-as-usual' refurbishment rate. This support needs to be doubled: about 70% of the housing stock of 40.5 million m² in Estonia (of which the majority is privately owned) was built prior to 1991 and needs renovation. These planned measures are in the right direction, but are not sufficient to initiate energy conversion and phase out oil shale use.

In addition, the proposed measures under climate action do not necessarily deliver long-term GHG emissions reductions due to the nature of the planned investments.

While energy efficiency gains are supported by the Structural and Cohesion Funds, there is not likely to be a successful shift towards sustainable public transport or a major shift in energy generation towards renewables and away from oil shale by the end of the current programming period. The development of wind and solar energy, which

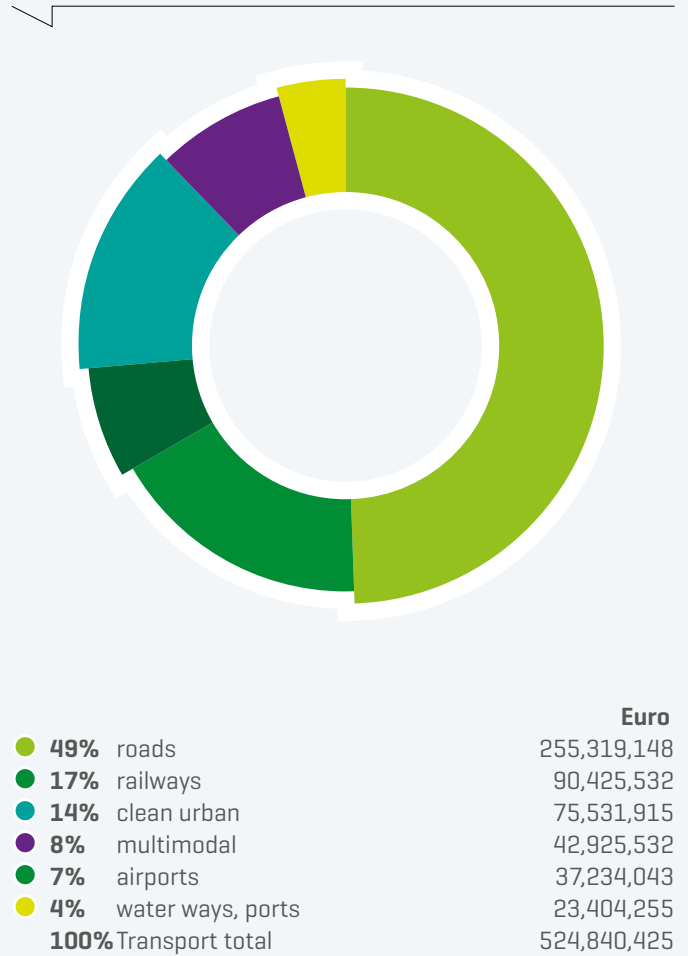
could play a major role in replacing oil-shale, is not supported. Biomass is the only supported renewable energy source (Graph 25) in the form of bio-methane production and distribution systems for vehicle fuels, aiming at 4 ktoe production. Sustainability criteria for biomass use are not prominent in the Operational Programme. The Programme contributes to the Estonian energy sector's ultimate development need to reduce oil shale in the country's power mix only to a tiny extent. Allocation of only 4.78% of all EU funds to clean energy will not make a serious contribution to the transition towards a more sustainable and decarbonised energy system. Although the priority axis dedicated to Sustainable Transport includes rail transport within the TEN-T network, the list of proposed projects reveals that the actions will promote unsustainable transport to a great extent. The expected results – 'improved rail connections and increased number of rail users, better travel planning opportunities, integration of travel modes and reduction of travel time, reduction of GHG emissions of transport' is not underpinned either by appropriate allocations towards sustainable modes (Graph 26), nor by appropriate measures: as the total length of reconstructed or upgraded railway line within TEN-T will be 110 km, the positive impact of the railway investments compared to the rest of the transport sector is marginal.

It is hard to imagine how the claimed transport goals, i.e., an increase by 7% (from current 43% to 50%) of pedestrians and public transport users or the doubling of train passengers from 4.2 million to 8.4 million per year by 2020, can be achieved while massive investment flows into unsustainable fossil fuel transport infrastructure – roads and airports⁸².

HORIZONTAL DIS-INTEGRATION OF CLIMATE CHANGE

The horizontal principles are not thematised in the Estonian OPs and reference is made to the Partnership Agreement only, meaning that the Operational Programmes do not reflect how horizontal principles like environment protection or climate concerns are applied within sectors. Thus the Operational Programme fails to apply the horizontal climate principle to the

GRAPH 26: Share of transport modes in total transport funding in Estonia. Source: our own calculations based on approved Operational Programmes according to categories of intervention



eligibility for support: projects do not have to demonstrate a positive impact on climate change mitigation and/or adaptation objectives, and there is no preference given to projects with a higher GHG reduction value. The Estonian authorities, on the other hand, claim that environmental goals and directions are important, and that they are horizontal themes, which are taken into account in designing all activities.

⁸² The support allocated to airports – EUR 37,234,043 – is allocated to the extension of Tallinn Airport runway and a parking area for planes. In order to extend the tarmac covered area, a drainage system and rain water collection system are to be built. Therefore the project is claimed to be 'contributing to environmental protection'.

RECOMMENDATIONS FOR IMPROVING CLIMATE ACTION FUNDING IN ESTONIA

A significantly larger share of EU support should be allocated or reallocated for the low-carbon energy transition and phasing out of oil shale use during the mid-term review. Only a small amount is planned to be invested in sustainable transport and sustainable urban development in Estonia. The majority of investments from the Cohesion Fund are allocated to TEN-T network roads and an airport extension. Allocating the majority of infrastructure investment support to road infrastructure and airport renovation does not ensure that mitigation goals are achieved, and potentially increases the country's GHG emissions. It is necessary to reallocate allocations from the Cohesion Fund budget only to those projects which deliver energy savings, GHG reduction and promote sustainable public transport.

Climate mitigation issues like increased efficiency of energy use, reduction of GHG emissions, etc., should be integrated horizontally into all priorities and measures of EU funds' implementation principles and regulations and not only those national priority development areas addressing specific gaps in the energy and transport sectors. In order to make European Union support more effective in achieving the EU's clean energy and climate goals, it has to be ensured that financing priorities and guiding principles for project selection include requirements for measurable energy efficiency and GHG reduction gains. Mainstreaming climate change mitigation into other horizontal themes like 'information society, regional development and governance' would secure the coherence of planned measures with climate goals.