Air Quality Policies

This document is based on research that UNEP conducted in 2015, in response to Resolution 7 of the UNEA 1. It describes country-level policies that impact air quality. Triple question marks (???) indicate that information for the section couldn't be found.

Please review the information, and provide feedback. A Word version of the template can be provided upon request. Corrections and comments can be emailed to Vered.Ehsani@unep.org and George.Mwaniki@unep.org.

COUNTRY NAME: LIECHTENSTEIN		
GOALS	**CURRENT STATUS**	**CURRENT / PLANNED POLICIES & PROGRAMMES**
GENERAL OVERVIEW	• **Overall situation with respect to air quality in the country, including key air quality challenges**[1]: • In 2011, about 84.3% of all greenhouse gas emissions were caused by energy-related processes. • Emissions within this sector were distributed as follows: 42.5% by Transport, 10.4% by Manufacturing Industries and Construction, and 42.9% "Other sectors" (Residential, Institutional, and Commercial combustion). • Compared to 1990, the emissions have decreased by 8.2% in this sector and overall by 3.6% (excluding LULUCF). • **Air quality monitoring system**[2]: Exist	• **National Ambient air quality standards**: National Ambient Air Quality Standards exists and meets the WHO standards and interim targets. There are no standards for $PM_{2.5}$[3]. • **National Air Quality Policy**: • Climate Protection Strategy in 2007[4]. • **Air Quality legislation / programmes**: • Air Pollution Prevention Act (1985)[5]. • Emissions Trading Act (2008), • The ordinance on the Clean Air Act was amended in 1999[6]. • **Other**[7]: • The Emissions Trading Act (EHG) sets up the general framework for the fulfilment of Liechtenstein's reduction obligations originating from the respective ratification of the Kyoto Protocol. In 2012 the government introduced a legally binding greenhouse gas reduction target from at least 20% compared to 1990 until 2020. • In addition the EHG states that emission reductions are first and foremost to be reduced by domestic measures. If reduction obligations cannot be achieved with domestic measures, the Government may participate in emission crediting activities abroad or in international emissions trading.

[1] Liechtenstein's Sixth National Communication under the UNFCCC and the Kyoto Protocol: https://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_br1_lie[1].pdf
[2] https://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_br1_lie[1].pdf
[3] http://airlex.web.ua.pt/
[4] http://www.aeeprn.com/docs/default-source/Liechtenstein-PDF/liechtenstein(26oct2013).pdf?sfvrsn=0
[5] http://unfccc.int/resource/docs/natc/pam/liepamn3.pdf
[6] http://www.pops.int/documents/implementation/nips/submissions/Liechtenstein%20NIP%2007.pdf
[7] https://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_br1_lie[1].pdf

	• Liechtenstein collects a wide range of data relating to climate, both through its own measuring stations and through interregional cooperation, especially with Switzerland. • Since 2001 the Eastern Swiss cantons and Liechtenstein jointly monitor ambient concentration of air pollutants.	• Besides this, the EHG implements Directive 2003/87/EC (Emissions Trading Directive) into national law and obliges two industrial installations in Liechtenstein to participate within the European Emissions Trading Scheme. Due to comprehensive amendments of Directive 2003/87/EC the EHG has been revised in 2012. The regulations of the EHG with respect to the participation of Liechtenstein in the Kyoto Protocols flexible mechanisms as well as with respect to domestic emissions trading are implemented by the Office of Environment.
	• **Industries that have the potential to impact air quality**: • Energy Industries, Manufacturing, mechanical engineering, electrical machinery, vehicle components, dental technology, food products, construction work and Combustion Industries. • **GDP of country**: $5.8 billion (2012)[8]. • **Industries' share of GDP**: 37%. • **Electricity source[9]**: • Hydroelectricity 94.2% • Fossil Fuel 3.12% • Solar/Wind 2.68%	• **Emission regulations for industries**: • Emissions regulations for stationary facilities exits (heating, industry). It was implemented since 1987 and revised in 1992 and 2005[10]. • The Emissions Trading Act implements Directive 2003/87/EC (Emissions Trading Directive) and Directive 2004/101/EC. • **Small installation's emissions regulated**: (Yes/No) **???** • **Renewable energy investment promoted**: • In 2014 photovoltaic installations in Liechtenstein generated around 481 Watt per capita surpassing Germany, who has been leading the photovoltaic ranking until now[11]. • Through Liechtenstein Energie GmbH & Co KG, the Foundation Prince Liechtenstein operates five hydroelectric power stations in Kalwang[12]. • The Foundation Prince Liechtenstein has been involved in the field of the generation of electricity from wind power for many years through its subsidiary Geoterra GmbH. Together with partner enterprises, Geoterra GmbH initiates the planning and development of wind power facilities. The Kettlasbrunn wind farm is made up of 20 two-megawatt wind turbines and achieves an annual output of 84 million kWh electricity for 20,000 households. Another two-megawatt wind turbine is located in the Wilfersdorf wind farm on land owned by the Foundation Prince Liechtenstein[13]. • **Energy efficiency incentives[14]:** (ex: Subsidies, labelling, rebates etc.) • Photovoltaic systems generating electricity are subsidized with a contribution of 2,500 CHF per installed output (kW). The maximum subsidy per system is CHF 200' 000. -- The

[8] http://www.heritage.org/index/pdf/2016/countries/liechtenstein.pdf
[9] https://en.wikipedia.org/wiki/Economy_of_Liechtenstein
[10] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[11] http://www.climatefoundation.li/
[12] http://www.sfl.li/en/businesses/renewable-energy/wind-power.html
[13] http://www.sfl.li/en/businesses/renewable-energy/wind-power.html
[14] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+

		generated electricity must be fed into the public network. The price guarantee for the first 10 years is 0.55CHF/kWh[15]. ● Thermal solar collectors can produce most of the warm water needed, thereby reducing heating oil and electricity consumption. The State subsidizes such collectors with a contribution of 350 CHF per square meter. ● **Residential technical installations:** If the building shell already fulfils the requirements for modern insulation, then residential technical installations with low consumption or operating with renewable energy can further enhance conservation. State subsidies may be granted up to 20,000 CHF. ● **Renovation of old buildings:** Many older buildings are insufficiently insulated against heat loss. Subsidies of up to 75,000 CHF may be granted for subsequent heat insulation ● **Incentives for clean production and installation of pollution prevention technologies[16]**: ● Through the sale of green electricity, the Liechtenstein Power Authority (LPA) pays 80 cents / kWh for energy generated from photovoltaic systems certified as "nature made star" from 2004-2009. ● The conveyance price for the energy volume for own use may be waived in the case of production systems based on renewable energies or systems for efficient. ● In 2008, CHF 1'681'873 were contributed to the renovation of old buildings, CHF 784'172 to residential technical installations, CHF 1'067'272 to solar collector systems, CHF 838'325 to solar photovoltaic systems and CHF 176'622 to demonstration facilities. The municipalities individually supplement the national subsidies with additional funds. ● **Actions to ensure compliance with regulations[17]:** (monitoring, enforcement, fines etc.) ● Offer of cooperation to "Energy City for Everyone" municipalities. "Energy City" municipalities are municipalities committed to energy conservation and energy efficiency that submit themselves to annual evaluation. Four municipalities (Triesen, Planken, Mauren, Schaan) have already received the label. ● **Other actions at national, sub-national and / or local level to reduce industry emissions[18]**: ● Almost all Liechtenstein municipalities provide additional funds to projects subsidized at the national level pursuant to the Energy Efficiency Act. In collaboration with the forestry sector,

[15] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[16] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[17] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[18] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+

		an increasing number of wood chip plants are used in public buildings to generate heat. The new Act and the Ordinance on the Liberalization of the Electricity Market provide mechanisms to support the conveyance of renewable energies. The Liechtenstein Power Authority also offers a "Green Electricity" label[19].
REDUCE EMISSIONS FROM TRANSPORT	• **Key transport-related air quality challenges[20]**: (ex: vehicle growth, old fleet, dirty fuel, poor public transport etc.) • Heavy goods traffic consists mainly of internal or cross border traffic (96 per cent); transit traffic accounts for only 4 per cent. • Two thirds of all vehicles are foreign-made. In 1999 trucks travelled a total distance of approximately 5 million kilometres, while passenger cars covered 134 million kilometres. • The number of passenger cars has quadrupled in the last 30 years. In 1998, there were 21,000 cars in use in Liechtenstein, that is, 0.65 cars per inhabitant. There has been a trend towards larger, heavier cars.	• **Vehicle emission limit[21]**: (Euro rating) Adoption of the European exhaust regulations (EURO norms), Continuous reduction of road traffic emissions. • **Fuel Sulphur content[22]**: (in ppm) Adoption of the European fuel regulations (Euro norms), Continuous reduction of road traffic emissions. • **Restriction on used car importation**: • **Actions to expand, improve and promote public transport and mass transit[23]**: • The public transport schedule has been significantly improved in recent years, especially in cross-border transport ("Liechtenstein Takt"). In 2006, a new public transport schedule was implemented, which entailed again significant improvements in frequency and attractiveness. In 2009 Liechtenstein, Austria and Austrian Railway signed a treaty to improve the railway infrastructure across Liechtenstein to establish a cross-border regional suburban train. • Establishment of the Liechtenstein Bus Authority and introduction of the "Liechtenstein Takt" regional train schedule to promote public transport. • **Promotion of electric scooters and electric bicycles:** The Liechtenstein State subsidies private purchases of electric scooters and electric bicycles by up to 50%. This achieves an increased substitution of short automobile rides. • **Actions to promote non-motorized transport[24]**: (ex: include sidewalks and bike lanes in new road projects, car-free areas etc.): The bicycle and pedestrian network is being expanded continuously and made more attractive. • **Other transport-related actions[25]**: • **Liechtenstein introduced a Heavy Vehicle Fee, analogous to Switzerland**. This fee is

[19] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[20] http://unfccc.int/resource/docs/natc/licnc3.pdf
[21] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[22] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[23] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[24] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+
[25] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+

		based on the polluter-pays-principle and is differentiated according to distance driven and the total weight of the vehicle. It increases productivity in road traffic, contributes to a large-scale shift of heavy goods traffic from road to rail, and in this way also eases the burden on roads in Liechtenstein. ● The public bus fleet has largely been converted to natural gas. Three natural gas fuelling stations have been built. The Government is examining the establishment of a biogas facility to generate gas from organic waste, which again could significantly improve the climate balance. ● **Promotion of green vehicles:** Vehicles with environmentally friendly engines (solar, electric, and/or hybrid vehicles) are exempt from the motor vehicle tax. This relative discount creates greater incentives to purchase and use such vehicles. As a member of the European Economic Area, Liechtenstein must also implement the EU regulations in this area. The focus is on the EURO norms (exhaust regulations) and on measures to promote energy-efficient vehicles, especially by introduction of a labeling system. The goal is to reduce CO2 emissions, precursor substances and N2O emissions. Furthermore the Government considers a system of motor vehicle taxation which implements a bonusmalus- system based on the energy efficiency and/or emissions of vehicles.
REDUCE EMISSIONS FROM OPEN BURNING OF AGRICULTURAL / MUNICIPAL WASTE (OUTDOOR)	● **Outdoor, open burning**[26]: (ex: is it commonly done? burning what kinds of wastes? etc.) ● Open garbage incineration isn't commonly practiced, although some smouldering occurs in landfills	● **Legal framework**[27]: (ex: is burning banned?) Open waste burning is prohibited. ● **Actions to prevent open burning of municipal waste and / or agricultural waste**[28]: ● The private or industrial combustions in Liechtenstein are inspected annually. The controls are implemented by the chimney sweepers of every community for private combustions, and by the Office of Environmental Protection for industrial combustions.
REDUCE EMISSIONS FROM OPEN BURNING OF BIOMASS (INDOOR)	● **Dominant fuels used for cooking and space heating**[29]: ● Less than 5% of the population are using solid fuels for cooking. ● **Impact**: **???**	● **Indoor air pollution regulated**: (Yes / No) **???** ● **Promotion of non-grid / grid electrification**[30]: ● In 2004 the Government adopted "The Energy Concept 2013". The strategy provides future-oriented impulses for the national energy policy. The focus areas of the concept are the promotion of efficient energy use, the use of renewable energies, and energy conservation. The goal is to increase the share of renewable energy in total energy use from 8% to 10% by 2013.

[26] http://www.pops.int/documents/implementation/nips/submissions/Liechtenstein%20NIP%2007.pdf
[27] http://www.pops.int/documents/implementation/nips/submissions/Liechtenstein%20NIP%2007.pdf
[28] http://www.pops.int/documents/implementation/nips/submissions/Liechtenstein%20NIP%2007.pdf
[29] http://data.un.org/Data.aspx?d=MDG&f=seriesRowID%3A712
[30] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+

		• A further goal is to triple the use of solar energy through thermal solar panels, and to increase the production of electricity from solar energy through photovoltaic systems by a factor of 2.5. • **Promotion of cleaner cooking fuels and clean cook stoves**: **???** • **Other actions to reduce indoor biomass burning, or to reduce its emissions**[31]: • **Heat insulation regulations:** Buildings and installations must be planned as energy-efficient as possible (minimum insulation values), according to Ordinance / SIA Norm 380/1. If the building volume exceeds 2000 m3, the heating requirements may not exceed 80% of the SIA value.

Secondary Sources used in the research:

[3131] Greenhouse gas emission trends and projections in Europe 2007 – Country profile: https://www.google.com/#q=Emission+regulations+for+industries+Liechtenstein+