The European Union's Transitional Assistance and Institutional Building Programme – TAIB 2010

STRENGTHENING CAPACITIES FOR IMPLEMENTATION OF ENVIRONMENTAL LEGISLATION AT LOCAL LEVEL

GUIDELINES FOR PREPARATION OF AIR QUALITY PLANS

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EuropeAid/134079/D/SER/MK

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Description	Guidelines for preparation of Air Quality plan

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PROJECT SYNOPSIS

Programme Name	The European Union's IPA Technical Assistance and Institutional Building Programme - TAIB 2010 Programme		
Project Name	Strengthening Capacities for Implementation of Environmental Legislation at Local Level		
Reference No:	EuropeAid/134079/D/SER/MK		
Contract Number	11-41299/1		
Project Duration	January 2015 – July 2016		
Project Commencement (Date Kick-Off Meeting)	20th January 2015 (22nd January 2015)		
Project End Date	20th July 2016		
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Overall Objective	The overall objective of the project is to contribute to improved environmental protection, monitoring and implementation of the national environmental legislation in the country, at both central and local level.		
Purpose	The purpose of this Project is as follows: • To enhance capacities of LSGUs for implementation of the environmental legislation. • To enhance the coordination among central and local government in implementation of environmental legislation.		
Expected Results	**RESULT 1 Strengthened administrative capacity** • Assessment of the administrative capacities at municipal level for environmental implementation and assessment of their legal environmental competencies carried out; • Programme for Reform and Strengthening the Administrative Capacities for Implementation of Environmental Legislation at Municipal Level accompanied with list of legal documents that support environmental implementation at local level prepared. • Long-term and short-term Training Programme approved and trainings provided according to the short-term Programme; • Strengthened administrative capacities for implementation of environmental legislation on central and local level; **RESULT 2 Environmental legal documents which contribute to the environmental implementation at the local level prepared** • Legal documents (manual, guidelines, check lists, procedure or other)prepared, and if necessary legal acts, for implementation of		

	selected environmental legal acts under the competence of LSGUs, including Guidelines for assessment of Elaborate for protection of environment at local level according article 24 of the Law on Environment; • Guidance for preparation of EU financed infrastructure projects prepared, • Programme for rising of environmental public awareness at local level prepared; and • The upgrading of designed (software) and developing Programme for establishment of data collection, reporting and information system for selected LSGUs prepared and implemented. **RESULT 3 The adopted environmental legal documents at local level implemented** • Selected (most priority) measures from the Programme for reform and strengthening the administrative capacities for implementation of the environmental requirements at municipal level implemented; • Trainings for development and implementation of Local Environmental Action Plans for 40 people provided and recommendations for improvement of the LEAPs process and monitoring of LEAPs implementation in selected LSGUs prepared; • Implementation of environmental legislation at local level mainly related to air quality, water and IPPC sector with focus on the issues which need to be considered when issuing permits for B – installation (air and noise monitoring, environmental impact assessment through elaborate for environmental protection) improved and implementing manuals, guidelines and check lists for this purpose prepared.
Key Activities	• Activity 1 Preparation and implementation of stakeholders' involvement plan • Activity 2 Assessment of legal requirements for environmental protection activities in LSGUs and assessment of administrative capacities for implementation and development of required reform programme • Activity 3 Implementation of strengthening the administrative capacity in LSGUs • Activity 4 Strengthening of Local Environmental Action Plans development and implementation • Activity 5 Development and implementation of training programme • Activity 6 Public awareness raising and information management
Key Stakeholders	• Ministry of Environment and Physical Planning (Local Self Government Unit, IPA Unit, Department for EU); • Ministry of Local Self-Government; • Association of Units of Local Self-Government (ZELS); • Nine (9) selected pilot LSGUs; • The Eight (8) Centres for planning regions; • NGOs relevant to the project activities; • B installations within the nine (9)selected LSGUs; • Public Utility Companies; • The public in general.

<table>
<tr><td>Target Groups</td><td>
• Ministry of Environment and Physical Planning (Local Self Government Unit, IPA Unit, Department for EU);
• Ministry of Local Self-Government;
• Association of Units of Local Self-Government (ZELS);
• Nine (9) selected pilot LSGUs
<table>
<tr><td>Planning region</td><td>City/LSGUs</td></tr>
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- LSGU of GjorcePetrov
- LSGU of Aerodrom</td></tr>
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- LSGU of Gostivar
- LSGU of Jegunovce</td></tr>
<tr><td>Southwest Region</td><td>- LSGU of Ohrid
- LSGU of MakedonskiBrod
- LSGU of Debarca</td></tr>
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<tr><td>Report Number</td><td>GUIDELINES FOR PREPARATION OF AIR QUALITY PLANS</td></tr>
<tr><td>Authors of the Report</td><td>Marijonka Vilarova & Dame Dimitrovski</td></tr>
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LIST OF ACRONYMS

As	Arsenic
BC	Black carbon
CAFE	Cleaner Air for Europe
Cd	Cadmium
CO	Carbon monoxide
CORINAIR	Co-ordination of Information on AIR emissions
EC	European Commission
EEA	European Environment Agency
EF	Emission Factor
ELV	Emission limit value
EMEP	Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
EU	European Union
IPPC	Integrated pollution prevention and control
LAAQ	Law on ambient air quality
LOE	Law on environment
LPS	Large Point Source
LSGU	Local self-government
LV	Limit value
MoEPP	Ministry of Environment and Physical Planning
MoAFWE	Ministry of Agriculture, Forestry and Water Economy
NFR	Nomenclature For Reporting
NH_3	Ammonia
Ni	Nickel
NMVOC	Non methane volatile organic compounds
NO_x	Nitrogen oxides
O_3	Ozone
Pb	Lead
PM10	Particular matter with a size up to 10 micrometres
PM2.5	Particular matter with a size up to 2.5 micrometres
RM	Republic of Macedonia
SNAP	Selected Nomenclature on Air Pollutants
SO_2	Sulphur dioxide
TSP	Total suspended particulates

1. INTRODUCTION

These Guidelines have been prepared within the project "Technical Assistance for strengthening the capacities for implementation of environmental legislation at local level", EuropeAid/134079/D/SER/MK,for the purpose of supporting LSGUs in the drafting of Air Quality Plans

Clean air is vital to human health. High level of pollutants in the air, especially particulate matter (PM10) endangers human health and degrades the environment.

The Government of the Republic of Macedonia in 2012, on the proposal of the Ministry of Environment and Physical Planning, adopted the National Plan for the Protection of ambient air quality, (Official Gazette of RM no. 170/2012), which defines measures, whose implementation should bring improvements of the air quality in the whole country, and consequently would have the effect of improvement of the air quality at local level.

In order to fully improve air quality at local level, there is a need for serious involvement of the local authorities who have to work on the convergence criteria for better local air quality. Namely, where, in given zones or agglomerations, the levels of pollutants in ambient air do not meet the stipulated criteria for air quality, local authorities are required to develop an Air Quality Plan (referred as "Plan" in the further text) which would define actions and measures to be taken in order to achieve the prescribed criteria.

The preparation of these plans is of great importance for air quality improvement at local level, as they represent a basis for developing local strategies for improvement of air quality.

The procedures described in these guidelines will assist ensuring consistency in the approach of preparation and implementation of the plans to improve air quality by each LSGU. The procedures also elaborate practical methodologies for the preparation of such plans.

The proposed guidelines are prepared on the basis of existing regulation on Air Quality management.

The guidelines consist of seven chapters, which describe step by step the method of preparation of the plan, define the responsible institutions, the method of collecting and processing of the data, the method of defining measures, the manner of adoption of the plan and monitoring of the implementation of the measures defined in the Plan. It also contains five Annexes with questionnaires that can be used for data collection from different institutions. Annex 3 describes the methodology for estimation of emissions in cases where emission measurements are not available.

2. AIM OF THE GUIDELINES

Recommendations, guidance and procedures for the method of preparation of local plans for air quality are the main objectives of these Guidelines. Specifically the aim is to:

- explain the legal obligations of the LSGUs and MoEPP regarding the preparation of the Plan under the Law on ambient air quality and relevant by-laws;
- help the LSGUs in determination of the critically polluting substances;
- identify the responsible authorities for the preparation of the Plan;
- provide clear benchmarks and explain the manner of collection, processing and analysis of the air quality and air emissions data;
- give guidance for adequate assessment of the air quality and air emissions;
- propose ways for identification and research of potential contaminants (businesses, traffic and furnaces etc.);
- provide a clear definition of the measures and actions for air quality improvement and provide prioritization of measures in accordance with the shares of various sources of emissions.

3. LEGISLATIVE FRAMEWORK

For the realization of the ambient air quality objectives, set in the Law on ambient air quality (LAAQ - "Official Gazette" no. 67/04, 92/07, 35/10, 47/11, 59/12, 100/12, 163/13), as well as for the purpose of their planning and implementation, a plan for air quality improvement should be established.

The Plan will be prepared in accordance with Article 27 of LAAQ and in accordance with the Rulebook on detailed content and manner of preparation of a plan to improve air quality ("Official Gazette" no. 148/14), which arises from Article 26 of the Law on Air Quality, where the requirements of the CAFE Directive 2008/50 / EC of the European Union regarding preparation and submission of such plans are transposed.

Plans to improve the air quality are required to be developed for those zones and agglomerations where the levels of concentrations of certain pollutants in ambient air exceed the limit and/or target values of those pollutants. The goal is to lower the concentrations of pollutants in line with the set limit and target values. The limit and target values and other criteria for air quality of different pollutants are given in the Ordinance on limit values of levels and types of pollutants in ambient air, alert thresholds, deadlines for reaching the limit values, margins of tolerance for the limit values, target values long-term goals ("Official Gazette" no. 50/05, 4/13).

According to Article 26 of the LAAQ, the plan for air quality improvement is prepared by the Mayor of the municipality and the Mayor of the City of Skopje, in cooperation with Ministry of Environment, for a period of five years.

The responsible institutions for financing the implementation of measures defined in such plans are institutions at central and local level (Article 63 and 64 of LAAW), and other entities, legal and physical entities owners or users of installations that are sources of ambient air pollution (in accordance with Article 28 of LAAQ).

4. GENERAL CONSIDERATIONS OF THE AIR QUALITY PLAN

4.1 Responsible bodies and coordinative body

In given zones/LSGUs where the levels of pollutants in ambient air exceed any limit value or target value, plus any relevant margin of tolerance in each case, the LSGUs shall ensure that an air quality plan is prepared. The plan is required to contain measures for air pollution reduction from different sources. Therefore, the preparation of the plan is required to include contributions/input from representatives of the different sectors involved.

For the purpose of preparation of the plan, it is suggested that a Coordination body is formed and coordinated by LSGUs, supported by MoEPP.

In case there is not enough capacity for preparation of the plan, an LSGU may outsource this activity to a consultant.

Anyway, before the start of the drafting of the plan the LSGUs should form a coordinative body responsible for its preparation.

The coordinative body is formed by the responsible authorities (mayor/council of the municipality) of the LSGU. An LSGU should appoint a coordinator for the preparation of the plan, who should have adequate knowledge of the requirements set down in the national legislation for ambient air quality, as well as knowledge of the sources of emissions that contribute to air pollution at local level.

The coordinative body responsible for the preparation of the plan should include representatives from all relevant institutions at central and local level, and it is recommended to include members from neighbouring LSGUs. During the drafting phase of the plan the coordinative body also should include representatives of major installations, NGOs, the public and other interested parties. The person appointed as coordinator should request from the MoEPP:

-designation of a contact person, who will serve as a contact point and will put at disposal all available data from MoEPP in this area, as well as
-provision of technical support, if necessary, for preparation of the plan.

The chapter of the plan "**Responsible institutions"** includes a list of contact information for all representatives that took part in the coordinative body, as well as contact information for all institutions responsible for the implementation of the defined measures.

4.2 Methods of data gathering

The first step in air quality planning is to obtain clear understanding of the current (as well as historical) state of the environment, and the atmospheric conditions that may affect air quality.

Table 4.1 Methods of data gathering

Element	Details
Ambient air quality standards	Based on health and environmental indicators. Provided by national environmental standards. Augmented by national ambient air quality guidelines and ambient targets specified in regional plans.
Monitoring networks	Must include both air quality and meteorology data. Additional monitoring for the purposes of the national environmental standards may be necessary.
Emission inventories	Emissions quantified by source and location.
Predictive models	Validated numerical prediction tools to calculate spatial, short and long-term impacts. Models are used to estimate projections for emissions inventories and the dispersion characteristics of an airshed to ultimately provide comprehensive understanding of the airshed that is so necessary for determining action.
Regulatory instruments	Regulations, regional plans, by-laws, incentives, etc.
Communication	System to give information to public on air quality. Includes reporting requirements under national environmental standards.
Strategy	Policies and measures to ensure standards are achieved and maintained (e.g. regional plans, airshed action plan).

In order to effectively manage air quality in an airshed or region, it will be necessary to answer the following questions:

- What are we trying to achieve? (national environmental standards for air quality, regional plan ambient air quality targets/goals, national ambient air quality guidelines).
- Where we can find necessary data?

Table 4.2 Institutions and data bases

Institution	Data base

1.	MoEPP	○ Cadastre on polluters and pollutants for the whole country territory ○ Data from State automatic air quality monitoring system ○ Air quality measurements data from indicative measurement campaign ○ Emission measurements data from A-IPPC installations ○ Data from Requests and issued A-IPPC permits and adjustment permits with an adjustment plan ○ Register of the installations subjected to the EIA system /elaborates
	LSGUs	Data for the installations located on the LSGU's territory and neighboring municipalities under jurisdiction of LSGUs ○ Requests and issued B-IPPC permits and adjustment with an adjustment plan ○ Register of installations subjected to the elaborates ○ Emission measurements data ○ Data on raw materials and fuel combustion
		Commercial and administration facilities ○ Emission measurements data ○ Data on fuel combustion
		LSGUs and neighboring LSGUs ○ General data on topography, climate, meteorology, demographic data ○ Air quality measurements data from indicative measurement ○ Data from conducted survey regarding type of stoves used and quantity and type of fuel used for individual heating ○ Traffic data from counting or traffic center
5.	Ministry of interior	○ Detail data on the vehicle fleet structure – MOI database
6.	Hydro meteorological institute	○ Meteorological and hydrological data for the particular LSGU
7.	State statistical office	○ Activity data on Industrial production, Livestock, Energy, Construction, Transport etc.
8	Institute for public health	○ Data on population exposure on air pollution
9	Universities and Scientific institutions	○ Models, studies, articles and research results, if any.
10	Ministry of Economy	○ Energy balance, fuel consumption, fuel characteristics, etc.
11	MoAFWE	○ Agricultural data, forestry data, water supply etc.

If necessary relevant data is not available on web or as a hard copy, the coordinative body should send questionnaires to the relevant institutions listed above.

Questionnaires with detail defined data are provided in ANNEXES 1-5 which are part of this document. After all relevant data are gathered, the coordinative body should process the data and make data analysis, bearing in mind following questions:

- What are the limitations of the data?
- What is the data showing us (current/historical trends)?
- Are there appropriate quality control mechanisms in place (i.e. is the data validated)?
- What do we know that we don't know? (uncertainties, error bars, upper and lower bounds on estimates)
- Are there areas where good air quality is important, like National parks or pristine areas, communities with vulnerable populations? (This can help identify priorities).

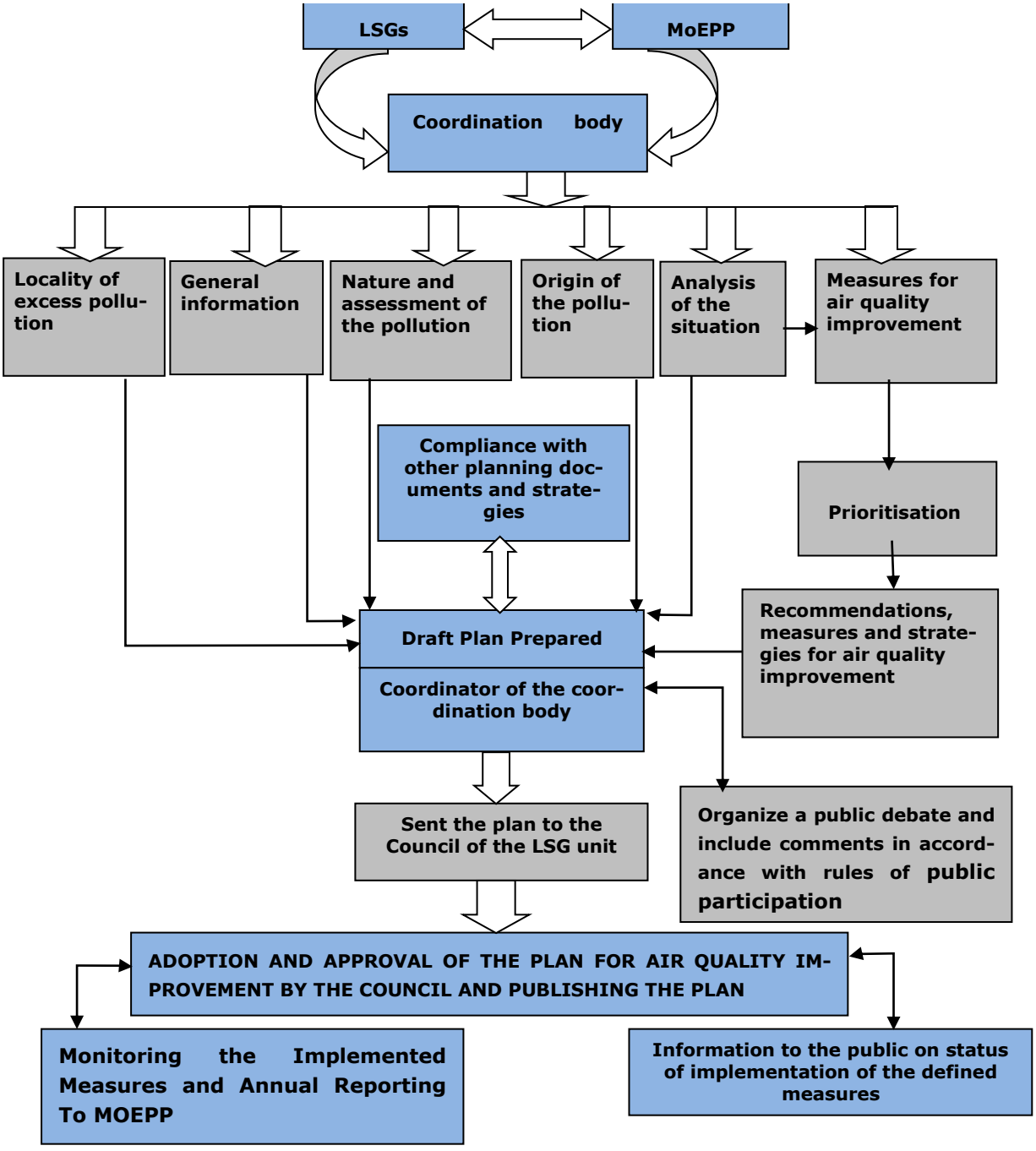
4.3 Review of the existing planning documents

Before starting preparation of the plan, it is necessary that the coordinative body undertakes research and gains access to existing planning documents for air quality improvement such as the National Plan for air quality, the local action plan on the environment and neighbouring LSGUs (if they exist), the plans for waste management and other relevant plans in the field of environment. In doing so, the body needs to determine whether the main objectives of the plan correspond to other planning documents. If measures already adopted in other planning documents are taken into account in the local plan, it is necessary to indicate the source, namely refer to the plan from which the measures have been taken.

It is very important, that the coordinator of the body submits a request to the representatives of institutions given in Table 4.2 within the body, to obtain information on the status of implementation of measures from planning documents with relevance to the LSGU.

4.4 Scheme of the cycle for air quality improvement plan preparation

Figure 4.1 Scheme of the cycle for air quality improvement plan preparation



5. CONTENT AND STRUCTURE OF THE PLAN FOR AMBIENT AIR QUALITY IMPROVEMENT

The content of the Air quality plan is defined in the Rulebook on the detailed content and the methods of preparing the plan for the ambient air quality improvement and has the following elements:

1. Locality of the exceeded pollution
2. General information
3. Responsible authorities
4. Pollution nature and assessment
5. Origin of pollution
6. Status quo analysis
7. Details and measures or projects for ambient air quality improvement that existed prior to the enactment of the LAAQ
8. Details of the adopted measures and projects in terms of pollution reduction
9. Detailed data of measures or projects that are planned or studied for a long time period
10. Analysis of the situation from a health point view
11. List of publications and documents that are used to complement the necessary information
12. In addition the plan shall contain the results from implementation of actions and measures defined in the National plan for Ambient Air Quality 2013-2018.

5.1 Locality of excess pollution

The excess pollution identified for one or more pollutants is presented in a map of the zone or municipality. It may be a case where the excess pollution has been identified in only a part of the zone/region/municipality. In such a situation, the actions and measures for air quality improvement should be directed towards the critical part of the territory.

The locality of the excess pollution is identified by comparing previously gathered ambient air quality data with the limit values and target values defined in the Ordinance on the limit values of the levels and types of polluting substances in the ambient air and alert thresholds, deadlines for achievement of limit values, margins of tolerance for the limit values, target values and long-term targets (Official Gazette of RM no 50/05, 4/13).

This means that the coordinative body should, on the basis of the performed analysis, define the excess pollution in a zone/region/municipality and prepare description of the identified location (measuring station on map, geographical coordinates, larger industrial facilities and commercial facilities, main crossroads etc.).

5.2 General information

Once the zone or municipality (or separate part of the municipality) that has a concentration of a pollutant that exceeds the air quality criteria, a brief description of the territory with excess pollution should be provided. This territory then should be categorized as urban, industrial, rural, combined urban and industrial or other. This is particularly important in the further chapters where it is necessary to identify and assess emissions sources and to define the measures that need to be implemented for air quality improvement.

This chapter shows the polluted area expressed in km^2 and population density (these data can be found in the publications issued by the State Statistical Office). This determines whether the polluted area is a densely populated area, and thus the number of population that is exposed to air pollution.

This section displays topographical data of the territory for which the plan is prepared, climatological features and meteorological conditions. Here, the meteorological conditions including dominant wind direction and wind speed, humidity, precipitation, and average temperatures on a yearly basis should be explained. The competent authority for these data in the Hydro-Meteorological Service (HMS). This means that this part of the Plan should be prepared in collaboration with HMS representatives.

5.3 Nature and assessment of the pollution

The air quality assessment is performed by analysis of the data of the concentrations of the pollutants measured for a period of five consecutive years. In cases where data is not available for the whole period of five years, shorter sample period, containing data from existing measurements of concentrations of pollutants should be taken into account. The air quality data should be acquired from the MoEPP (State automated ambient air quality system monitoring is in the competence of MoEPP), in cases when the state monitoring stations are located in the area identified as polluted and for which the plan is being prepared. Where available, air quality data from local monitoring networks or data from the indicative measurements performed by other institutions such as the Centres for Public Health should also be obtained.

In this chapter it is necessary to write a brief description of the State automated ambient air quality monitoring system within the competence of the MoEPP and, in particular, the monitoring stations that are located on the territory of the LSGU for which the plan is prepared. Namely, the author should gather and present following information:

- Date on which the monitoring stations / measuring points were set up
- Address(of the locality of the monitoring station)
- Characterization of surroundings of the monitoring stations / measuring points
- Sources of pollution in the vicinity of the monitoring stations / measuring points
- Parameters that are measured (environmental and meteorological)
- Photograph of the monitoring stations / measuring points
- Geographical coordinates of monitoring stations / measuring points
- Map on which the monitoring station or measuring point of the air pollution should be presented.

In addition, the competent institutions which are performing the measurements are required to provide information on the air quality measurements methods. The reference methods for the ambient air quality measurement are prescribed in the Rulebook on the methodology for monitoring the ambient air quality ("Official Gazette" of the Republic of Macedonia no. 138/09). It is important to note that one may use any other method which can demonstrate a consistent relationship to the reference method. In such an event, the results achieved by that method must be corrected to produce results equivalent to those that would have been achieved by using the reference method. MoEPP is obligated to deliver monthly and annual reports on Ambient Air Quality to LSGUs on whose territory a monitoring location have been established, and shall publish such reports on the MoEPP web site.

The annual hourly concentration data, the daily average concentrations, the annual average concentrations for all five years are then analysed, separately for each year and for all measured pollutants. Also exceedances of the limit & target values and information and alert thresholds, as well of the long-term goals, are to be identified. Comparison and data assessment is performed according to the given legal criteria for air quality defined in the Decree on the limit values for levels and types of pollutants in ambient air and alert thresholds, deadlines for reaching the limit values, margins of tolerance for the limit value, target values and long-term goals.

Type of data per pollutant that is processed in order to assess air quality and to determine the critical pollutants are presented on the following table:

Table 5.1 Type of data per pollutant

Pollutant	Hourly	Daily	Annual	8th hours daily average	Long term objective	Information threshold	Alert threshold
PM_{10}	✓	✓	✓				
NO_2	✓	✓	✓				✓
CO	✓	✓	✓	✓			
SO_2	✓	✓	✓				✓
O_3	✓	✓		✓	✓	✓	✓
C_6H_6			✓				
B(a)P			✓				
Heavy metals			✓				

Data coverage also must be taken into account and should be consistent with the data quality objectives defined in the Rulebook on the criteria, methods and procedures for ambient air quality assessment (Official Gazette of Republic of Macedonia no. 169/13). However, in cases where there is not sufficient data on the concentrations of a particular pollutant, and the measured concentrations exceed the limit or target values, the air quality assessment should be carried out with the available information even though the data coverage is lower than the required standard.

Tables and graphs for all pollutants must be created for all available measurement stations (located on the territory of the LSGUs or neighboring units) for the given time period, in order to have more reliable and adequate approach for identification of the critical pollutants.

Afterwards, the results obtained are used to fill in the table below which gives a clear picture of those pollutant concentrations that are above the set ambient air quality criteria and those which are below the standards. The table also shows for which of the pollutants there are not available measurements and for which the data coverage is below the required standard etc. These four different categories are colored differently according the legend given below.

Below the AQ standards	Above the AQ standards	No measurements	Insufficient data coverage

Table 5.2 Pollutant Value per Year

Pollutant	AQ standards (LV - Limit Value, TV - Target Value)		Year -4	Year - 3	Year -2	Year -1	Year
PM_{10}	Daily LV	50 µg/m^3, not to be exceeded more than 35 times per year					
	Annual LV	40 µg/m^3					
NO_2	Hourly LV	200 µg/m^3, not to be exceeded more than 18 times per year					
	Annual LV	40 µg/m^3					
	Alert threshold	400 µg/m^3,3 consec-utive hours					
CO	LV	10 mg/m^3, max daily 8th hours mean					
SO_2	Hourly LV	350 µg/m^3, not to be exceeded more than 24 times per year					
	Daily LV	125 µg/m^3, not to be exceeded more than 3 times per year					
	Alert threshold	500 µg/m^3, 3 con-secutive hours					
	Critical level for vegetation protection	20 µg/m^3, annual concentration					
O_3	TV	120 µg/m^3 max daily 8th hour mean not to be exceeded more than 25 days per calendar year aver-aged over three years					
	Long term objective	120 µg/m^3 max daily 8th hour mean					
	Infor-mation threshold	180 µg/m^3, 3 con-secutive hours					
	Alert threshold	240 µg/m^3, 3 con-secutive hours					
C_6H_6	Annual LV	5 µg/m^3					
B(a)P	Annual TV	1 ng/m^3					
Heavy metals	Annual TV for As	6 ng/m^3					
	Annual TV for Cd	5 ng/m^3					
	Annual TV for Ni	20 ng/m^3					
	Annual LV for Pb	0.5 µg/m^3					

Where fewer air quality measurement data are available, the air quality assessment may be carried out by the use of other assessment methods such as dispersion modelling.

5.4 Origin of the pollution

5.4.1 Providing data for identification of the sources of pollution

The manner and methods of data collection is established, through activities adapted to the existing conditions in the LSGUs that are preparing the plan. This is particularly dictated by the air quality. In most cases, there is not enough data needed for analysis and determination of the sources of air emissions. Therefore emission data should be obtained from available documentation from LSGUs and documentation from State authorities and institutions that possess the necessary data for the preparation of the plan. Also, additional research and/or emission measurements could be conducted in order to collect other necessary data.

In the identification of the emission sources, the following data sources are used:

- Cadastre of Environment in the part for polluters and pollutants in air
- Registers of A and B IPPC permits
- List of installations that need to prepare the environmental impact assessment reports
- Data from emission measurements

In the case when there is no data or cadastre available, it is necessary to carry out further research. Data should be collected from studies and surveys conducted in this area of from other relevant institutions. This will include the collection and analysis of data from several relevant institutions at international, national and local level. This applies in particular to the State Statistical Office, Central Registry, Institute of Public Health, Universities, etc.

Determination of the quantities of pollutants in the air can be conducted in several ways:

- Emissions of the pollutants can be taken directly from the cadastre of environment from the central and local level – Regarding the data from cadastre of polluters and pollutants it is necessary that LSGUs submit a request to MoEPP to obtain data on air emission from the installations and the other commercial buildings (educational institutions, hospitals, hotels, etc.) and other neighbouring LSGUs, in case they possess the requested data.
- Emissions of pollutants are obtained by measurements conducted on the installations. Since most installations are subject to A or B IPPC licencing, they are required to perform regular measurements with the frequency prescribed in the permits and such data is available. Measurements can be obtained directly from the installation for the purpose of the analysis necessary for the preparation of the Plan. This is to be done in a form of a request that is submitted by the coordinative body or by MoEPP in the case of A-IPPC permits or the LSGU in the case of B-IPPC permits. The data obtained from measurements of individual plants, usually stationary sources is usually accurate and could be used for determination of the quantities of pollutants**.**
- In cases where measured emission data is not available, the calculation method, which uses data on activity rate and emissions factors – can be used. This method is used for calculation of emissions from diffuse sources (waste, agriculture, distribution of petrol products, construction, asphalt plants, installations dealing with the excavation of mineral resources, etc.) as well as from mobile sources. Calculations are made using methodologies adopted by law. Calculations are made by multiplying the activity rate - AR (as yearly production, consumption of raw materials, fuel, etc.) and emission factors EF-already established at European level and included in the guidelines (Joint guidance of EMEP/EEA available on the website http://www.eea.europa.eu/publications/emep-eea-guidebook-2013). More details on the method of calculation are given in Annex 3, which is an integral part of this Manual.

The data for activity rate (fuel quantity, quantity of raw materials and products on yearly base) are available in:

- **Applications and issued A and B IPPC permits** - Applications and the A and B IPPC permits should be available on MoEPP and LSGU web pages. In these documents the data from the emission measurements as well as data that can be used for calculations are available.
- **Population census,** available on the State Statistical Office web page.
- **Conducted surveys for type of fuels used in households**–Such a survey should be conducted by the LSGU for all households that are not included in the central heating system. The data needed for the model should consist of:

    - heated area,
    - type of heating system (furnace, boiler, etc. by type),
    - type of fuel used in the system (gas, wood logs, pellets, etc.) and
    - the approximated amount of fuel per season.

If there is a need to project the model to wider area, following data can be helpful:

- insulation of the heated object,
- time of usage of the heating system (hours/day),
- interior temperature of the object, etc.

Preferably implementation of such a survey should be carried out before the preparation of the plan.

- **Vehicles and fuels database**– Detailed information on the structure of the vehicles. Survey or data from the Traffic management center is needed for activity rate (driven kilometers per type of vehicle, per type of fuel). Since this data cannot be exactly measured, it is necessary to balance the model with the data for fuel used in the transport sector in the area of interest.
- **Publications on the State Statistical Office web page** – data for industrial production, agriculture, construction, energy balance and transport.

Classification of emission sources

Identified emission sources are classified as stationary, diffuse and mobile sources. Definitions of these type sources, in accordance with the LAAQ, are given below:

- **Stationary source**s or point sources emit pollutants in the air from strict outlets (technological processes, industrial plants, power plants etc.)
- **Diffuse or surface sources** (collective sources) are sources as: heating in residential buildings, combustion of fossil fuels in commercial-institutional facilities, mining activities, quarrying of minerals, materials handling, distribution of fuel, petrol stations and oil terminals, agricultural processing, municipal waste disposal as well disposal and incineration of other types of waste. Most individual emissions from diffuse sources have low-intensity, but when concentrated in a relatively small area, their joint share in air pollution can be quite substantial.
- **Mobile sources** comprise road and off- road traffic involving the combustion of fossil fuels in their work and non-exhaust emission from their activity.
- **Natural sources** of air emissions are sources emitting pollutants which occur due to natural disasters and phenomena such as fires, earthquakes, floods, volcanoes and other natural activities.

It is important to note that different sectors can contribute differently to the emission of any specific pollutant. Therefore, data available from measurements and calculations made (in tonnes / year) is categorized by sources (stationary, diffuse, mobile, natural) for each pollutant.

5.5 Analysis of the situation

After collection and analysis of the data, the main sources that contribute the largest share of the total emissions of pollutants are defined at LSGU level. **In this chapter the shares of certain sources (stationary, diffuse, mobile, and natural) are shown in tabular and graphical format with the total emission of each pollutant expressed as a percentage.** At the same time, the share of various diffuse sources such as waste management, construction, excavation of raw materials, and agriculture in the total emissions of pollutant in percentages can be determined.

Analysis performed in this way provides guidelines on preparation of the next chapter or the road map for the type of measures that should be taken to improve air quality and to enable the prioritization of measures.

For example, when in the total emission of a particular pollutant, the highest share comes from stationary sources that include most of the industrial sector, it is necessary to propose measures such as revision of IPPC permits, introduction of BAT, installing devices for purification of waste gases prior to their release into the air, reduce fugitive emissions etc.

When a particular installation that is located on the territory of LSGU is defined as the dominant source for local pollution, it is necessary to use dispersion modelling for impact assessment of this specific installation in the area where air pollution is localized. This approach should be implemented with support of the MoEPP.

In the case when the traffic is dominant source, it is necessary to foresee measures to reduce emissions from traffic at local and central level either by renewal of fleet or by promoting alternative transportation.

When diffuse sources are dominant, it is necessary to take measures for cleaner fuels, for changes of stoves, application of the code for good agricultural practices to reduce emissions from agriculture, application of standards for construction sites and regular cleaning the streets to reduce emissions from construction.

In this chapter, detailed data should be presented for other factors that are responsible for exceedances of the limit values especially in the case of particulate matter due to their characteristic to be transported for large distances including trans-boundary transport. The formation of secondary particulate matter in the atmosphere needs to be taken into account, including information from regional models that should be provided by the MoEPP representatives that are members of the working group for preparation of the plan.

5.6 Details of measures for air quality improvement

The intent and purpose for preparing the plan is to identify measures and actions to improve air quality. This is why you have to be very careful in the process of identifying measures and to ensure they cover key sectors that have a big impact in air pollution. During planning, the measures or projects for air quality improvement that existed before the adoption of the Plan should be included. **They can be local, regional, national and international measures.** It should also include measures for projects that have been already planned. At the end it is important to define and propose in the plan, **objectives and deadlines for implementation, the necessary financial resources and the authorities responsible for monitoring and evaluation of the implemented activities.** Preparation of this section should take into account the Guidance for defining the measures as specified in **Article 4 of the Rulebook on the detailed content and manner for preparation of a plan to improve air quality.**

Measures should be described. Each measure should be set carefully, specifying:

- which pollutant is to be reduced,
- who is responsible for implementation,
- over which period and
- how much implementation will cost.

During the process of proposing and selecting the measures, there is a need to be careful with regard to the characterization of the measures in terms of timeframe and in terms of the funds necessary for their implementation. This is because LSGUs have limited resources for implementation of the measures.

In the process of defining the measures is necessary to determine the type of measures whose implementation will reduce emissions from key sources and thus reduce concentrations of critical pollutants.

In this section, additional to the identification of the polluting substance, it is important to provide a comprehensive description of the measures. Measures included in the plan must be described as precisely as possible including how they will be implemented and how they will affect the concentrations of pollutants. It is necessary in this process to identify the authorities responsible for each measure and to define the time required for implementation of the measure (short, medium, long term). Also, it is very important to have knowledge about the necessary funds for implementation of the particular measure. This is necessary for the detailed design of the order for implementation of the measures and for proper planning of the budget funds on annual level by the LSGUs and other relevant institutions responsible for implementation the measures.
It is recommended to use an information sheet for each of the measures, as for example the following:

Table 5.3 Description of the measures

MEASURE NO	
MEASURE NAME	
Description of the measure	
Objective of the measure	
Target pollutant	
Change in concentration	
Air quality benefits	
Other impacts	
Implementation	
Responsible authority	
Time of implementation	
Costs	
Other requirements	
Indicator for following the implementation	

5.7 Analysis of the situation from a health point view

In this section the assessment of the health risks posed by critical pollutants for a given number of people exposed to the pollution, should be presented. The health impact assessment is made in accordance with the methodology of the World Health Organisation. In addition, existing and future health measures to tackle the effect should be planed.

5.8 List of publications and documents used to complement the necessary information

In this chapter all publications and documents that are used in the preparation of the Plan are listed. The list is prepared in order of their appearance in the plan. In case the document is available on a web site, a link to the source should be provided.

6. ADOPTION AND APPROVAL OF THE PLAN

After preparation, the plan is submitted to the representatives of the coordinative body for their opinion. Any comments received are entered into the Plan, and then it is sent for approval to the MoEPP. After receiving a positive opinion from the MoEPP, the draft plan is set out on the LSGU web site of the respective LSGU for comments and opinions from the public and preferably should be presented at a public meeting. After entering the observations received from the public, the plan is adopted by the Municipal Council and comes into force from the date of its adoption.

7. MONITORING OF THE PLAN IMPLEMENTATION

For the monitoring implementation of the Plan for Air Quality, it is necessary to outline indicators during the process of defining the measures. Following the indicator will allow assessment of the degree of implementation of the relevant measure. In order to get the information on the status of implementation of the measures, the coordinator appointed by the LSGUs has to submit a request to the competent institutions responsible for implementing the measures.

Based on the data received, the coordinator assigned by the LSGU, has to prepare a report on the extent of implementation of the planned measures for improvement of the air quality. This kind of report is prepared twice over the life-span of the plan, or two reports for a period of 5 years. The first evaluation report on implementation of the plan is prepared after 2.5 years (30 months) from adoption of the plan, and the second report at the end of the plan, or after 5 years.

The LSGUs shall submit the evaluation reports, regarding implementation of the plan, to the MoEPP and publish them on the LSGU web site.

ANNEX 1 QUESTIONNAIRE FOR DATA GATHERING FROM A-IPPC INSTALLATION, B-IPPC INSTALLATIONS AND INSTALLATIONS SUBJECTED FOR PREPARATION OF ELABORATES

This aim of this questionnaire is data gathering from different type of installation such as:

1. A-IPPC Installations
2. B-IPPC Installations
3. Business entities that are subject to EIA reports/elaborates

When filling out the tables, A and B IPPC installations as well as those defined as PRTR, fill all the tables as provided. In case when some data are not required in the environmental permit (this is for the B IPPC installations) they do not fill these fields. Business entities subjected to EIA reports/elaborates, should fill in Table 1 as a whole and Table 2 and 3 in those fields for which they have available data (annual fuel consumption, quantity of raw products per year).

Table A1 GENERAL INFORMATION

Name of installation	
Activity (code of activity according Central register)	
Place	
Postal code	
Street and Number	
Location (X, У,)	
Statistical region	
Telephone	
Fax / e-mail	
Activity of the installation and environmental permit	
Production / Non-production	
IPPC (A or B)	
PRTR	
EIA study /elaborates	

Table A2 INFORMATION FOR FUELS, RAW MATERIALS AND PRODUCTS

Installed electrical power on entry (MW)				
Type of source/ by entry*	Energy / Industrial/Production/Other			
Installed thermal power on entry(MWth)				
Fuel	Fuel1	Fuel2	Fuel3	Fuel4
Fuel type				
Total consumption (t)**				
Lower thermal power of the fuel (kJ/kg)				
Fuel composition (mass. %)	S			
	N			
	Cl			
Type of materials used/raw materials /tonnes per year				
Quantity of materials/products/tonnes per year				

* Circle your chose
** daily, monthly, annual

Table A3 OPERATIONAL INFORMATION

Total number of operating hours	Daily/Annual	
Working regime	Continuous	
	Semi continuous	
	Seasonal	
	At the beginning of the season	
	At the end of the season	
Annual capacity exploitation (%)		

Table A4 INFORMATION ON THE EMISSION OF POLLUTANTS

No.	Name of pollutant	CAS	Emission quantity		ELV mg/Nm^3	Note *
			mg/Nm^3	(kg/h) ort/year		
1	SO_2					
2	NO_x (expressed as NO_2)					
3	TOC(Total organic carbon)					
4	CO					
5	VOC(Volatile organic com-pounds)					
6	Metals and their compounds As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Sb, TI, V, Hg and other metals emitted from the industry*					
7	Dust					
8	Asbestos					
9	Chlorine and its compounds					
10	Fluorine and its compounds					
11	Arsenic and its compounds					
12	Cyanides					
13	Substances and materials for which it is demonstrated that they poses carcinogenic and mutagenic properties or which may have influence on the air pollution					
14	Polychlorinated dioxins and furans					
15	Other relevant substances resulting from the technological process					
16	Polycyclic aromatic hydro-carbons					

* In the note field please respond if the emissions are measured in accordance with the require-ments of the IPPC permits and relevant for the particular process or estimated (the estimation should be performed in accordance with the Rulebook on inventory and determination of the lev-els of the pollutant emissions in the ambient air in tonnes per year, for all types of duties, as well as other data needed for submission of the Program for monitoring the air in Europe (EMEP) (Of-ficial Gazette of the RM No. 142/07);

Table A5 REPORTS, MEASUREMENTSAND OTHER DOCUMENTS IN ACCORDANCE WITH OBLIGATIONS SET DOWN IN THE IPPC PERMITS,THAT CAN BE USED DURING THE PREPARATION OF THE AIR QUALITY IMPROVEMENT PLAN

	The available documents should be listed here and provided to the LSGUs
Annual report: -fuels and raw materials used -monitoring of air emissions -fugitive emissions that caused pollution -defects of equipment that have or might have caused increased air emissions - incidents that have or might have caused increased air emissions	
Other reports: -record of complaints	

ANNEX 2 Questionnaire for data gathering from traffic

Questionnaire for data gathering from traffic

Table A6 Road motor vehicles and trailers according to the type and year of production (for the Country, statistical region, municipality, city)

Year of first registration	Motorcycles	Passenger vehicles	Buses	Goods vehicles	Work vehicles	Road tractors	Tractors	Trailers
Year of updating the cadaster – n[1]								
Year n-1								
Year n-2								
Year n-3								
Year n-4								
Year n-5								
Year n-6								
Year n-7								
Year n-8								
Year n-9								
Year n-10								
Year n-11								
Year n-12								
Year n-13								
Year n-14								
Year n-15								
Year n-16								
Year n-17								
Year n-18								
Year n-19								
Year n-20								
…								
Up to 1986								
Before 1986								
Total								

* By this the environmental category of the vehicle can be determined.

Table A7 Number of road motor vehicles according to the type of fuel by category

Fuel type\vehicle type	Motorcycles	Passenger vehicles	Buses	Goods vehicles	Work vehicles	Road tractors	Tractors	Trailers
Gasoline								
Diesel								
Mixture								
LPG								
CNG								
Gasoline + LPG								
Electric								
Other								
Total								

Table A8 Yearly and daily consumption of fuels (for the Country, statistical region, municipality, city)

Type of fuel	**t/year or l/year**		**t/day or l/day**	
Gasoline				
Diesel				
LPG				
CNG				

Table A9 Avg. number of driven kilometers per type of vehicle

Vehicle category	Fuel Typical fuel consumption (g/km)	Avg. number of driven kilometers (km/year)
Passenger cars		
Gasoline		
Diesel		
LPG		
E85		
CNG		
LCVs		
Gasoline		
Diesel		
HDVs		
Diesel		
CNG (buses)		
Two-wheel vehicles		
Gasoline		

Table A10 Yearly exhaust emissions of pollutants from traffic (for the Country, statistical region, municipality, city)

Pollutant (t/year)	Yearly exhaust emission of pollutants from traffic			TOTAL
	From gaso-line	From diesel	From gase-ous fuels	
SO_2 (t/y)				
NO_2 (t/y)				
VOC (t/y)				
TSP (t/y)				
CO (t/y)				
Pb (t/y)				
TOTAL				

Table A11 Yearly non-exhaust emission of pollutants from traffic (for the Country, statistical region, municipality, city)

Vehicle category	PM surface (t/year)	PM tire and brake (t/year)
Passenger cars		
Gasoline		
Diesel		
LPG		
E85		
CNG		
LCVs		
Gasoline		
Diesel		
HDVs		
Diesel		
CNG (buses)		
Two-wheel vehicles		
Gasoline		
TOTAL		

The data from the tables is used as input in the CORINAIR methodology for emissions from traffic Mobile sources, 1.A.3.

ANNEX 3 Methodology for emissions calculations

In cases where **no measurements are available**, the methodology of calculations set down in the **joint EMEP/EEA air pollutant emission inventory guidebook from 2013** can be used. This methodology describes a tiered methodology (Tiers 1-3) for estimating emissions. Tier 1 methods apply a simple linear relation between activity data and emission factors. The manner of gathering activity data is described in the Annexes above. The emission factors for the most common sources of emissions for different sectors can be found in the following chapters of the Guidebook:

Table A12. Sectors and type of sources of pollution (joint EMEP/EEA air pollutant emission inventory guidebook from 2013)

Type of source	**Sector**	**NFR category in Guide-book**
Stationary sources	Combustion in industry	1.A.2
	Metal industry	2.C
	Chemical industry	2.D
Diffuse sources	Other solvent and product use	2.D-2.L
	Small combustion	1.A.4
	Minerals industry	2.A
	Waste	5.A
	Agriculture	3.B, 3.D, 3.F
	Fugitive emissions from fuels (coal mining, oil refining and storage, energy production)	1.B
Mobile sources	Road transport	1.A.3
Natural sources	Forest fires	11.B

After activity data is gathered and EF are found in the particular chapter of the joint EMEP/EEA air pollutant emission inventory guidebook from 2013, the calculation is performed by the use of the following formula.

$$E_{pollutant} = AR \times EF_{pollutant} \quad (1)$$

Where:
Epollutant stands for annual emission of pollutant in tonnes;
AR stands for activity rate (it may be fuel consumption, raw material used, and quantity of product, animal number etc. depends on the sector);
EF stands for Emission factor of the pollutants used for emission calculation in this report are presented in the following table:

The default Tier 1 emission factors are chosen in a way that they represent a 'typical' or 'average' process condition. For the higher Tier 2, and 3 more detail data and specific emission factors for specific technology process are used. Due to the limitation of activity data and need of well-trained staff for implementation of Tier 2 and 3 Methodology, it is recommended that LSGUs mainly to use the Tier 1 methodology in the calculations.

The representatives from LSGUs may ask for a support from the MoEPP when performing emission calculations and choosing proper activity data and EF in the estimation.

Disclaimer

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