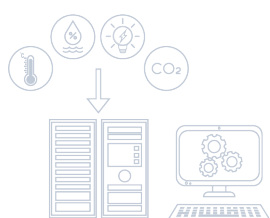


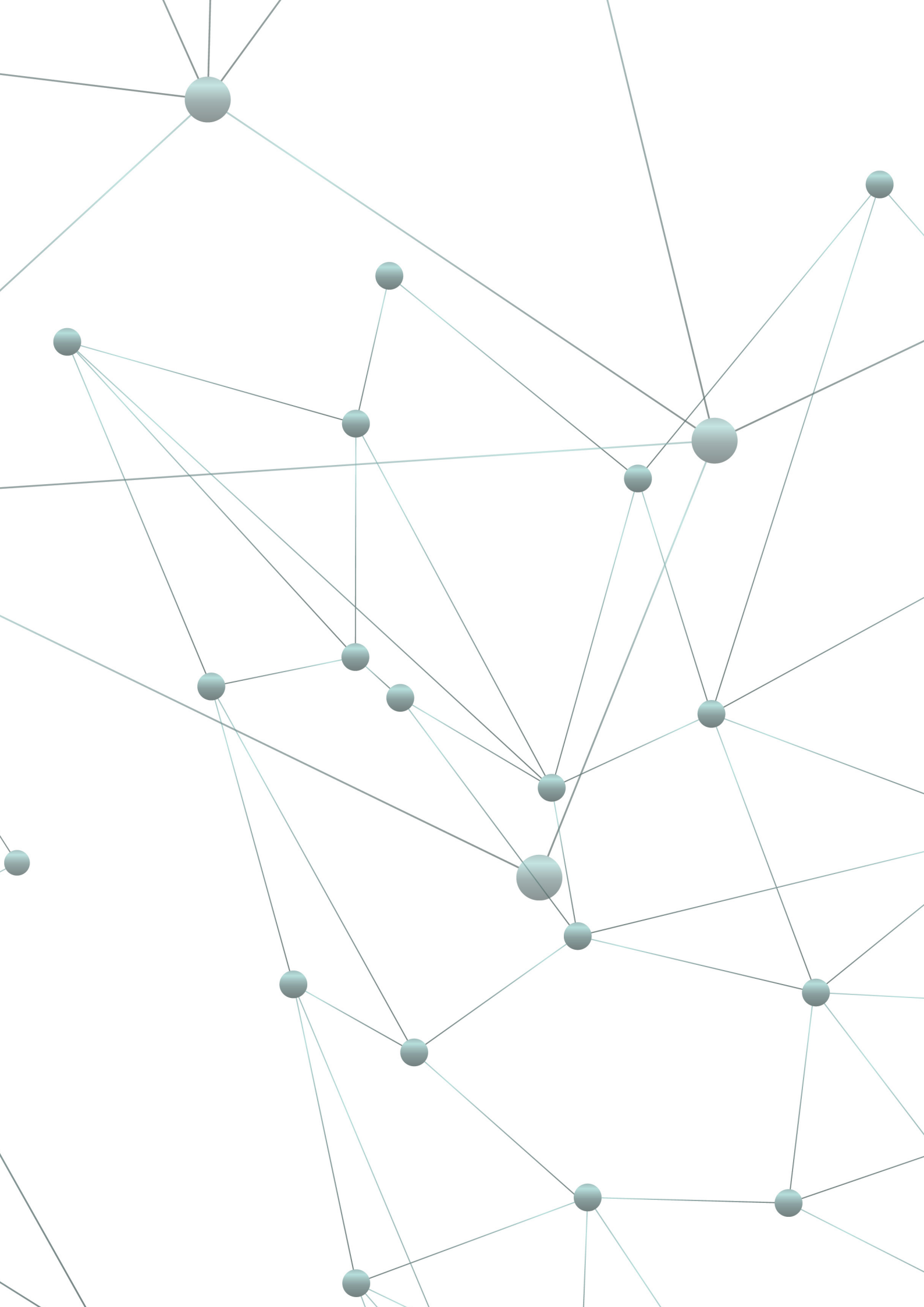


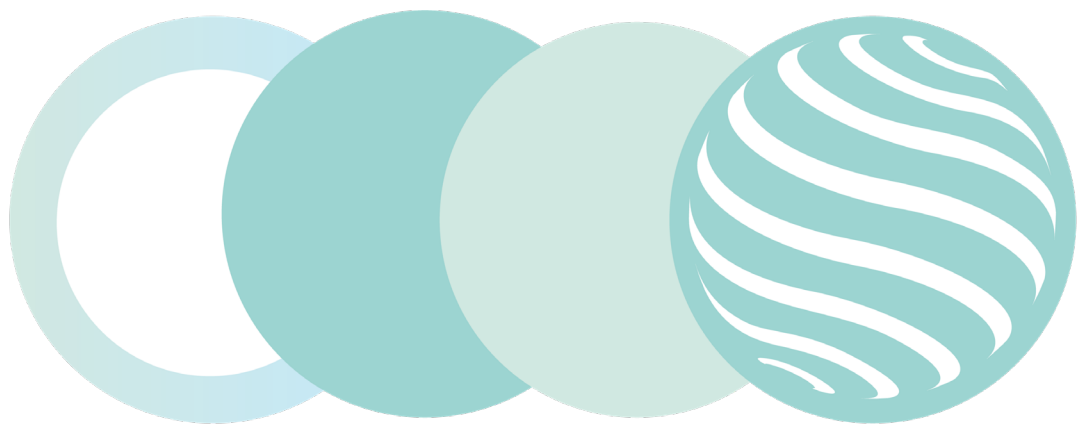
ENERGee Watch

Curriculum and learning material for Course:
Monitoring, Reporting, Verification



The ENERGee Watch project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement no. 892089.





Monitoring, Reporting, Verification



Introduction

The ENERGeE Watch project stems from the existing informal European network of regional greenhouse gas emission observatories managed by FEDARENE whose mission is to collect, monitor, and report Greenhouse gas (GHG) Emissions and implement energy saving strategies and policies.

Many of the structures are governed by a local consortium gathering at least several public authorities and energy data suppliers. They are very often supported by public authorities and integrated within existing regional organisations such as energy agencies or public departments. The value that this type of structure can provide stems from their expertise in data gathering, data analysis, and energy planning.

These observatories contribute strongly towards building a representation of the territorial impact on climate change and a framework for identifying areas of responsibility and priority areas for action. To best serve society, the observation of GHG emissions is a prerequisite before taking any appropriate action. The tasks of an observatory are very diverse. An observation system primary task is to provide data – most often free of charge – and improve knowledge about the territory's current and future situation with regards to impacts caused by climate change (energy and information related to GHG emissions). In some cases, air quality, social, economic or environmental effects on climate change are included. As a result, an observatory will characterise the current situation and the challenges on climate change, identify trends and influencing factors, and define various scenarios to meet any long-term energy and climate targets.



Another role is to analyse and monitor the development of the territory's situation on climate change, by identifying the challenges and by keeping an account of GHG emissions and energy consumption in order to measure the progress. To this end, an observatory will determine both quantitative and qualitative objectives, identify resources and opportunities to take action. Moreover, an observatory provides expertise and advice in policy development and in the decision-making process. Indeed, it tracks progress against fixed objectives, adjusts efforts and focuses on climate action. Lastly, it evaluates the impact of climate action in terms of energy saved and GHG emissions avoided, then providing local stakeholders with a forum for sharing knowledge and experience gained.

The overall aim of ENERGee WATCH is to launch a peer-to-peer learning program to enable regional and local authorities to timely and accurately define, monitor and verify their sustainable actions. The learning process targets regional and/or provincial authorities and their agencies and observatories that are responsible for collecting and overseeing the monitoring of mitigation and adaptation indicators in order to empower them to make use of the best practices learnt.

Regional observatories are powerful tools to implement efficient strategies at local and regional levels. Through ENERGee Watch, the objective is to increase the capacity of data observation across Europe to best support local and regional decisions makers in their fight against climate change.

Monitoring, Reporting, Verification

Overall description of the course

Introduction

The Local Authorities are facing significant barriers when it comes to implement actions included in the SECAPs: Limited competences, Limited financial resources, Difficulties to access European funds, Limited capacity (technical knowledge).

The peer to peer learning program on “Monitoring, revision and verification of data” will give emphasis to enhance the capacity of local authorities to implement sustainable projects through the:

- Development of internal administrative structures for the successful implementation and monitoring of sustainable energy action plans (roles, support, prioritization, budgeting, and tools)
- Process to verify energy data
- Data quality improvement
- Development of business plans, feasibility, and environmental analysis for sustainable energy Projects

Course objectives

In this course, mentees can achieve the following learning objectives:

- Objective 1: To create vision and establish the proper internal administrative structures.
- Objective 2: To know the key actions needed to ensure political and administrative support for the successful implementation of a SECAP.
- Objective 3: To perform an energy data verification process.
- Objective 4: To establish methodologies to improve data quality.
- Objective 5: To develop energy modelling and elaborate future scenarios.
- Objective 6: To understand the key financial indicators.
- Objective 7: To visualise sustainable energy project ideas on Sustainable Business Model Canvas.
- Objective 8. To elaborate feasibility and environmental analysis for energy projects.
- Objective 9: To plan and monitor the progress and the impact of SECAP actions.

Topics

The training course will cover the following topics:

- Vision setting
- Establishing an Energy & Climate Team
- Data Processing and Verification
- Energy Modelling and Scenarios
- Sustainable business model canvas and financial feasibility analysis
- Implementation & successful monitoring

Target

The training course is addressed to a) local authorities' staff which are directly related to the SECAP implementation and to b) support structures (energy agencies) who provide technical support and expertise. The candidates will have the opportunity to empower their knowledge in critical issues for successful implementation of the SECAPs.



Mentors



Savvas Vlachos

Director of the Cyprus Energy Agency

Savvas Vlachos started his professional career in 2004. He is Environmental Engineer graduated from the Polytechnic School of Crete, Greece, and he acquired his master's degree on Civil Engineering at the Polytechnic Department of the University of Cyprus. At the beginning of his career, he worked as an environmental engineer and he was responsible for preparing environmental impact assessment for development projects as well as designing waste treatment facilities.

He joined the Cyprus Energy Agency in 2009 as an Energy expert and he was involved in studies, audits and certifications related with energy efficiency in buildings, Sustainable Energy Action Plans for local authorities and Renewable Energy Sources technologies. He has professional skills on Energy Auditing of buildings, street lighting, harbors airports, industries and agriculture sector. He is a qualified Energy Auditor and a Qualified Energy Expert to the official governmental registries. In addition, he is experienced for the use of technical equipment such as Infrared Camera, power analyzer, gas analyzer etc. He is also a certified trainer by the Human Resources Development Authority of Cyprus with previous experience on training for various technical subjects such as photovoltaic technology, energy efficiency of buildings, feasibility studies, project management, environmental policies and buildings energy performance certification.

Since September 2016, he is the Director of the Cyprus Energy Agency and he is responsible for the operation and the strategic development of the Agency. He has participated in more than 40 EU funded projects as project manager and he is currently the coordinator of a 2.7 M€ funded project (eea and Norway grants) on youth employment with 10 international partners. He is also the Project Manager of a contract for Project Development Assistance (funded by the European Commission) to be provided to the Ministry of Education, Culture, Sport and Youth of Cyprus in order to trigger investments of 7.5 M € in upgrading 25 school buildings into Nearly Zero Energy Buildings. Since January 2017, he is also the Local Manager of the Programme Pioneers into Practice in Cyprus which is funded by the Climate – KIC and the European Institute of Innovation and Technology (EIT).



Charis Kordatos is a Forester/Environmental Scientist, he has graduated the Aristotle University of Thessaloniki in 2006 and holds MSc in Environmental Biology of the same University. He joined the Cyprus Energy Agency in 2009 and has been specialized in matters concerning the environmental impacts of installing RES in different types of landscape, the utilization of wood biomass and has been trained in the Geographic Information Systems (GIS). He has extensive experience in the realization of Environmental Impact Assessments (EIAs) regarding the installation of large-scale RES projects and he is responsible for the overall co-ordination and implementation of the undertaken EIAs.

He is familiar with the Covenant of Mayors methodology for Sustainable Energy and Climate Action Plans (SECAPs) and supports local authorities for implementing sustainable actions and projects towards the climate adaptation. He is involved in the Green Public Procurement (GPP) support structure of the Agency providing guidance and training to public/local authorities and he is participating in different GPP networks and forums. He participates in many co-funded EU and national projects as an expert and project coordinator, related to sustainable use of RES, environmental management and green policies.

Myrto Skouroupathi is a qualified Environmental Engineer and a member of the Scientific and Technical Chamber of Cyprus. She completed her Masters of Engineering in Environmental Engineering with First Class Honours from University College London (UCL) in 2016. She has worked on community level projects on sustainable infrastructure and renewable energy.

She joined the Cyprus Energy Agency in 2017 as an Environmental Engineer and she is involved in European co-funded projects as a technical expert and educator. She is managing a mobility scheme on climate innovation, a project to reduce youth unemployment through green jobs, and provides technical assistance to projects on circular economy, energy efficiency and climate change addressing and adaptation..



Charis Kordatos

Climate Change and Environment Expert –
Team leader of the Cyprus Energy Agency



Myrto Skouroupathi

Environmental Engineer

Topic 1

Vision setting

Description of the topic (what)

A further step to undertake and to make your municipality in line with the Covenant of Mayors' energy and climate objectives is to establish a vision. The vision for a sustainable future is the guiding principle of the local authority's SECAP implementation roadmap. It points out the priorities and the pathway in which the local authority aims to follow. A comparison between the vision and the local authority's current situation is the basis for identifying what actions and developments are necessary to achieve the goals set. The SECAP includes the information and highlights the activities for a systematic approach to gradually meet the vision of the municipality.

The vision serves as the uniting component that all stakeholders can refer to; meaning everyone from leading politicians to citizens and interest groups. It can also be used for marketing the local authority to the rest of the world.

The vision needs to be compatible with the EU climate action and the European Green Deal and with the Covenant of Mayors' commitments, i.e. it should imply that the 55% GHG emission reduction in the 2030 target will be reached (at the minimum) and that the city will gradually become resilient and adapted to the impacts of Climate Change. However, it could also be more ambitious and ensure the 2050 EU's climate neutrality objective will be enhanced at local level (European Climate Law).

The vision should be realistic but still ambitious. It should describe the desired future of the city and be expressed in visual terms to make it more understandable for citizens and stakeholders.

ENERGee Watch Partner Expertise

Many Local Authorities in Cyprus have joined the CoM and implement Sustainable Energy Action Plans to meet 2020 objectives. As many of the local authorities from Cyprus have proven their commitment to move forward and meet their 2030 objectives, further CO₂ reductions, Climate Change Adaptation, improved resilience, and energy poverty confrontation are expected to synthesise their long-term vision. The municipalities of Strovolos and Lakatamia are the first two municipalities from Cyprus that through workshops, public consultations and meetings with stakeholders have managed to set the city's vision based on which their approved SECAP was elaborated.

Relevant methods / tools (how to)

The training course will provide guidance to the mentees on how to set the vision towards a sustainable future and for a step by step on process of setting energy and climate objectives and targets.

Visioning should include a large diversity of stakeholders ensuring sustainability, climate resilience and well-being. The methodology will follow the "visual story" and consist six parts describing different aspects of the future-vision and the process to achieve it: Cover, Radical Ideas, Quotes, Headlines, Stack of Papers, Images [Source: Visual story tool – EIT Climate KIC].

Link(s) with other courses

Vision setting is a process that could also be performed in other courses, especially those include the establishment of a long-term strategy such as "Adaptation to Climate Change", and communication and outreach of city's priorities and vision sharing.



Practices in other European regions

The vision of the European cities is more ambitious than the EU MS. On average EU-28 cities have committed to a 31 % emissions reduction by 2020 from 2005 levels, ten points higher than the minimum target required. Next stop 2050 and climate neutrality.

Establishing an Energy & Climate Team

Description of the topic (what)

Devising and implementing a sustainable energy policy is a challenging and time-demanding process that must be systematically planned and continuously managed. It requires collaboration and coordination between various departments in the local administration, such as environmental protection, land use and spatial planning, economics and social affairs, buildings and infrastructure management, mobility and transport, disaster response, budget and finance, procurement, etc. In addition, one of the challenges for success is that the SECAP process should not be conceived by the different departments of the local administration as an external issue, but that it has to be integrated in their everyday life: mobility and urban planning, management of the local authority's assets (buildings, municipal fleet, public lighting...), internal and external communication, public procurement etc.

A clear organisational structure and assignment of responsibilities are prerequisites for the successful and sustainable implementation of the SECAP. A lack of coordination between the various policies, local authority departments and external organisations has been a considerable shortcoming in the energy or transport planning of many local authorities. This is why 'Adapting city structures, including allocation of sufficient human resources' is a formal commitment of those signing the Covenant of Mayors.

Relevant methods / tools (how to)

The training course will provide guidance to the mentees on how to adjust administrative structures and improve local capacity, how to ensure external support from supporting structures and energy agencies and how to engage citizens and stakeholders into the SECAP's decision-making process.

Covenant of Mayors' technical guidelines on setting the adequate administrative structure [Source: How to develop a Sustainable Energy Action Plan Guidebook – European Commission] as well as methods to map, analyse and engage stakeholders [Source: Stakeholder Mapping tool – EIT Climate KIC] into SECAP will be thorough explained.

Mentees will also be familiarised with examples and best practices from Covenant Signatories in Cyprus and Europe in general.



ENERGee Watch Partner Expertise

All the Local Authorities participating in the Covenant of Mayors and committed to reach the 2020, 2030 energy and climate targets, had been set up internal structures for the completion of the SEAPs-SECAPs.

Examples and best practices from the experience gained by the Cyprus Energy Agency during the elaboration and implementation of SEAPs and SECAPs in small and medium size municipalities in Cyprus between 2010-2020, will feed the training content of this course.

As an example, depending on the size of the municipality, the structure showcased in **Table 1** is proposed to be adopted.

Practices in other European regions

The “team” is the alpha and omega for successfully implementing the SECAP. The City of Aberdeen has established a concrete team for achieving the targets defined. City of Barcelona has internal structures that can run multi - sectoral projects like “superblocks”, which are related with climate, urban mobility, green infrastructure, and biodiversity plans and commitments.

Table 1
SECAP internal structure

Energy & Climate Plan	Position in the LA	Duties	Advisory Committee
Head of Charge	Mayor / City Manager	Supervision and Decision Making	
Coordinator	Officer	Coordination, implementation, monitoring and communication	
Member 1	Officer	Support	
Member 2	Environment, CC Officer	Support in climate change issues	
Member 3	Technician	Technical Support	
Member 4	Municipal Councillor	Representation of Municipal Council. Participation in meetings.	
Member 5	Citizens	Citizens' Representative. Participation in meetings	

Link(s) with other courses

The Energy & Climate team is fundamental for the successful implementation and monitoring of the SECAPs. It is relevant to data acquisition, Climate adaptation actions and SECAP communication and therefore it links with all EnergEEWatch training courses.

Data Processing and Verification

Description of the topic (what)

Baseline and biannual monitoring review and emission inventories creation require energy and CO2 emissions data acquisition at the local level. It is not enough just to collect data: data needs to be analysed and interpreted in order to inform policy. The data's quality is dependent on many factors and the therefore data processing and verification is important to ensure accurate and clear picture of 'where we are?', and 'where we go?', a description of the city's current and future situation in terms of energy and climate change.

ENERGee Watch Partner Expertise

The Cyprus Energy Agency, developed an excel based tool called LOCAL ENERGY BALANCES for the calculation of local (Municipalities and Communities) Energy Balances in Cyprus (in toe) and energy modelling and forecasting. The use of this tool has been very useful not only for the creation of baseline emission inventories of the Municipalities, but also in data verification and monitoring the impact of the implementation of local action plans.

Relevant methods / tools (how to)

The training course will provide guidance to the mentees on how to process and verify energy and CO2 data.

Covenant of Mayors' technical guidelines on data processing [Source: How to develop a Sustainable Energy Action Plan Guidebook – European Commission] as well as examples from Cyprus Energy Agency's data processing and energy modelling tool will be thorough presented and explained during the training.

Link(s) with other courses

This course is directly linked and complementary to the Course "Data Collection".



Practices in other European regions

Data reliability is crucial for the development of the Baseline emission inventory and for the monitoring procedure. Member States, such as the Netherlands, Denmark and Cyprus, as well as the UK, have developed a central database and/or tool to provide specific data to local authorities. The main aim of these tools is to assist the local authorities in implementing and monitoring local energy and climate action plans (Meshartility, 2014).

[Climate Monitor, Netherlands](#)

[Municipal Carbon Inventory Tool, Denmark](#)

[Cyprus Energy Agency](#)

Energy Modelling and Scenarios

Description of the topic (what)

Based on the data collected, their quality and on the different sets of hypothesis, it is important to establish scenarios: how would energy consumption and CO2 emissions evolve under current policies, what would be the impact of the projected actions, etc.? It is appropriate to build a Business as Usual (BAU) scenario, to forecast the level of energy consumption and CO2 emissions during the target year(s) in a scenario without SECAP. If there is an increasing trend, the local authority will need to make a greater effort to counterbalance it. To the opposite, in case of a decreasing trend, the local authority should consider setting a more ambitious reduction target than the minimum set by the Covenant.

Thus, it is recommended to perform energy modelling and elaborate additional scenarios with different level of ambition and success factor, in order to forecast which of those will lead to the 2030 goal achievement and under which circumstances. During the implementation of the SECAP, a municipal council might decide to switch from one SECAP scenario to another based on the progress achieved and the corrective actions needed to be taken.

ENERGee Watch Partner Expertise

The Cyprus Energy Agency developed an excel based tool called LOCAL ENERGY BALANCES for the calculation of local (Municipalities and Communities) Energy Balances in Cyprus (in toe) and energy modelling and forecasting. The use of this tool has been very useful not only for the creation of baseline emission inventories of the Municipalities, but also in scenarios elaboration and monitoring.

Relevant methods / tools (how to)

The training course will provide guidance to the mentees on how to perform an energy modelling and elaborate Business As Usual and SECAP scenarios.

Covenant of Mayors' technical guidelines on data processing [Source: How to develop a Sustainable Energy and Climate Action Plan Guidebook – European Commission] as well as examples from Cyprus Energy Agency's data processing and energy modelling tool will be thorough presented and explained during the training.

Link(s) with other courses

This course is directly linked and complementary to the Course "Data Collection".



Practices in other European regions

Energy modelling and Scenarios are essential for selecting the appropriate actions and the most fitting pathways. Countries that have developed central databases and energy tools mentioned in Topic 3 have the possibility to provide different energy scenarios for achieving the 2030 target or beyond.

Topic 5

Sustainable business models and financial feasibility analysis

Description of the topic (what)

Even If the SE(C)AP is an important tool to set the road-map for the energy transition and climate resilience, there is a clear implementation gap that is linked to the lack of knowledge on technical/financial viability and the most suitable business model of sustainable energy projects.

Choosing appropriate organisation, partnership and/or business model for implementation of actions could affect the economy/feasibility of energy actions and their implementation. A business model describes the rationale of how an organization creates, delivers, and captures value.

This topic aims to increase trainee's knowledge on key financial ratios and on proven successful forms of partnerships and business models for bankable energy projects. It will address factors that influence bankability of projects implementation, demonstrating successful forms of partnerships and business models.

Relevant methods / tools (how to)

The training course will provide insides to the mentees on how to perform a financial feasibility assessment of energy projects and on how to calculate the Internal Rate of Return, the Net Present Value, the Life Cycle Cost, the Cost-Benefit ratio and the simple payback.

It will also introduce the participants to the Sustainable Business Model Canvas that supports the development of an idea into a viable business model. The methodology follows a holistic approach regarding the relationships within and outside the organisation/business. Besides economic criteria it focusses on ecological and social consequences of the activity. It aims at maximizing positive and avoiding negative impact on society and nature. Therefore, sustainability is integrated into the core business of the organisation. The visualization on the canvas fosters coherence of the concept and clarification among the team members. It further supports communication with third parties and prepares for a solid business plan.

ENERGee Watch Partner Expertise

Examples from technical and feasibility assessment of sustainable energy projects in Cyprus will be demonstrated. These are related to energy efficient street lighting projects and energy renovation of public buildings.

Link(s) with other courses

This course is somewhat linked to the Course "Data Collection".



Practices in other European regions

Sustainable Business models are needed for introducing and supporting viable, green, innovative projects and solutions. Aradippou municipality (Cyprus) has promoted innovative financing solutions (combination of private and public funds to develop incentives) for installing photovoltaics and energy efficiency actions in the city. Other example is Local Energy Cooperatives which offers citizens the possibility to jointly own and/or participate in renewable energy and energy efficiency projects on municipal sites and infrastructures. Cities of Ghent and Mouscron (Belgium), Krizevci (Croatia), Barcelona (Spain) have already used this approach.

Topic 6

Implementation & successful monitoring

Description of the topic (what)

The implementation of the SECAPs is the main activity which leads to sustainable policies, projects and actions. Time, effort and financial means are needed; thus, the mobilisation of stakeholders and citizens is important. Monitoring is an essential step for identifying the progress of the main targets, individual projects, best practices, barriers and mistakes. It allows a continuous improvement of the process through the period implementation.

Relevant methods / tools (how to)

The successful implementation of the plan/project follows some basics steps:

- Identify priorities (e.g. per sector)
- Smooth internal communication
- Identify key stakeholders
- Feasibility analysis/Business model
- Financial resources (Local, National, EU)
- Timeframe

Monitoring of the SECAPs performances relays on the CO₂ savings (Energy Part) compared to the baseline emissions inventory and the CoM signatories commit to submitting a "Monitoring Report" every second year following the submission of the SECAP "for evaluation, monitoring and verification purposes". The CoM procedure will be detailed explained.

ENERGee Watch Partner Expertise

Monitoring reports and examples from the progress of Cypriot Covenant cities will be demonstrated.

Link(s) with other courses

This topic is directly linked to the Course "Data Collection".



Practices in other European regions

The city of Vila Nova de Gaia (Portugal) was the first to submit its monitoring results to the Covenant of Mayors in July 2014. One of the main challenges pointed out by the energy agency in charge of monitoring the results relates to the fact that the data is too disperse and needs to be gathered from different bodies. To face this situation, the agency has developed an Excel tool for data collection and analysis as well as a web-based tool specific to collect energy consumption data from all municipal buildings and facilities.

Colmar City (France) carries out an evaluation every six months in order to measure the progress in their SECAP implementation, using both qualitative and quantitative indicators. Based on this, the project team and steering committee analyse the results and decide on potential changes to the plan.

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ENERGee Watch



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