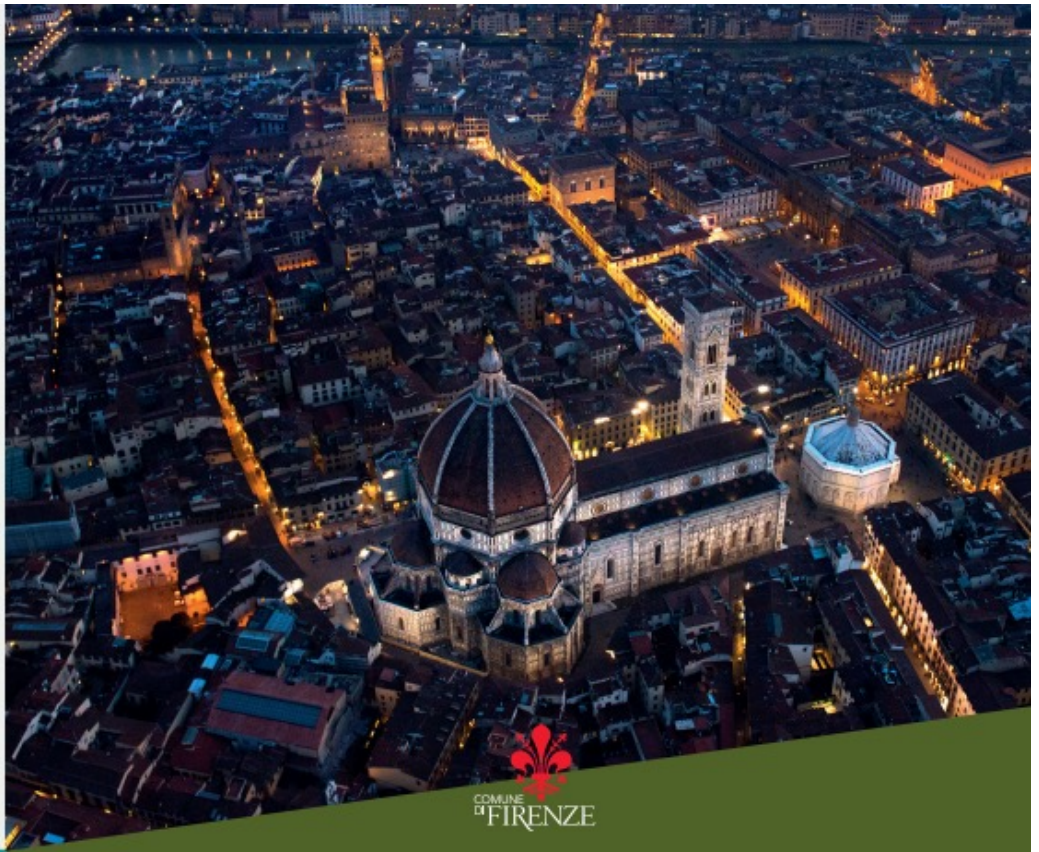
Covenant of Mayors
for Climate & Energy

Developing and monitoring a SECAP



COMUNE DI FIRENZE

PIANO DI AZIONE PER L'ENERGIA SOSTENIBILE E IL CLIMA

Florence in numbers

- It is the capital city of Tuscany region and of a **metropolitan city with 41 municipalities and about 1 million inhabitants**.
- Firenze can be defined as «daily use city»: with **380.000 residents**, there are daily 140.000 additional users coming in our city.
- The most of them are **commuters (101.000)**, with only 28.300 residents going out for work.
- The rest of the users are tourists, a primary resource for our economy: **before 2020 there were more than 14 million tourists per year.**

Centro Storico di Firenze
Inscritto nella Lista del Patrimonio Mondiale nel 1982

UNESCO Word Heritage
Since 17/12/1982.

The critical points

- ✓ Historical buildings stock
- ✓ Big administrative structure (about 5000 employees)
- ✓ Significant presence of tourists and commuters
- ✓ Services shared with other municipalities (waste and water management, public transport…)

Florence started a path towards sustainability convinced that urban environment can be improved, together with quality of life, and that the city could actively contribute to EU targets. Analysing its specific situation, it became clear how peculiar it is for cultural heritage, landscape and arts with million tourists per year. The main sectors for the interventions resulted to be buildings, transport and services where the municipality has heavily committed to obtain the expected results with a pack of integrated actions which will be able to change the emission profile of the city.

*"**Covid** pandemic has affected the implementations, especially for those measures related to mobility, making the assessment of results and comparison more difficult.*
On the other hand, this peculiar situation has highlighted the flexibility of ICT technologies to be used for further scopes (video-surveillance, wi-fi, smart city platform….).
The social acceptance of all the actions regarding sustainability and climate has improved thanks to the increase of sensibility towards green and sustainable life in urban areas «

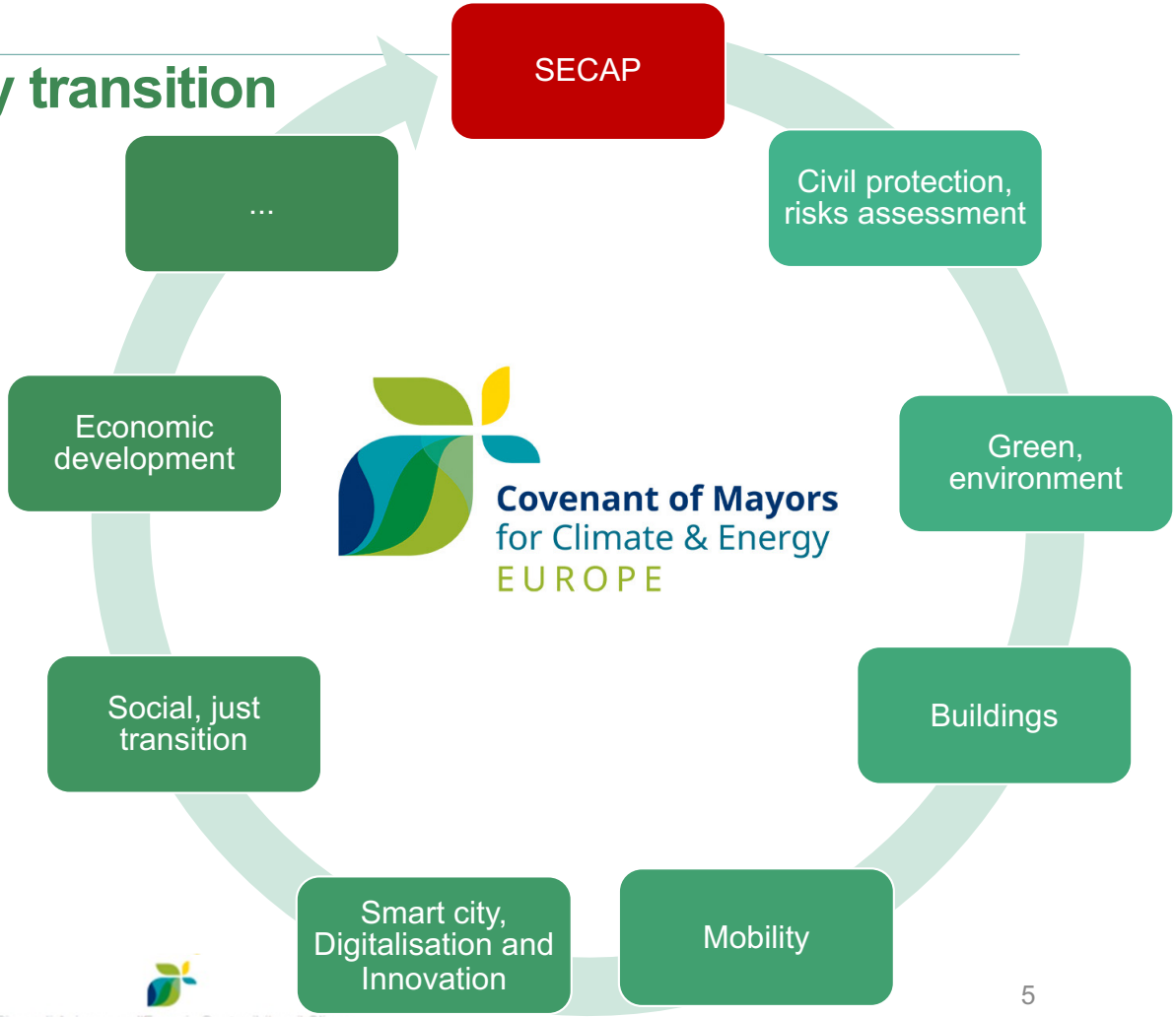
Vision & planning: Florence path towards climate protection

Our SEAP & SECAP
as master plans for the energy transition

MAIN FEATURES:

- ✓ Continuous update (Living plan)
- ✓ Sectorial integration (synergies, no Silos)
- ✓ Coordination among levels/ entities (cooperation)
- ✓ Participation (co-creation)

It is the reference guide for the definition of the Climate City Contract for the EU mission «climate neutral and smart cities»



SEAP/SECAP benefits

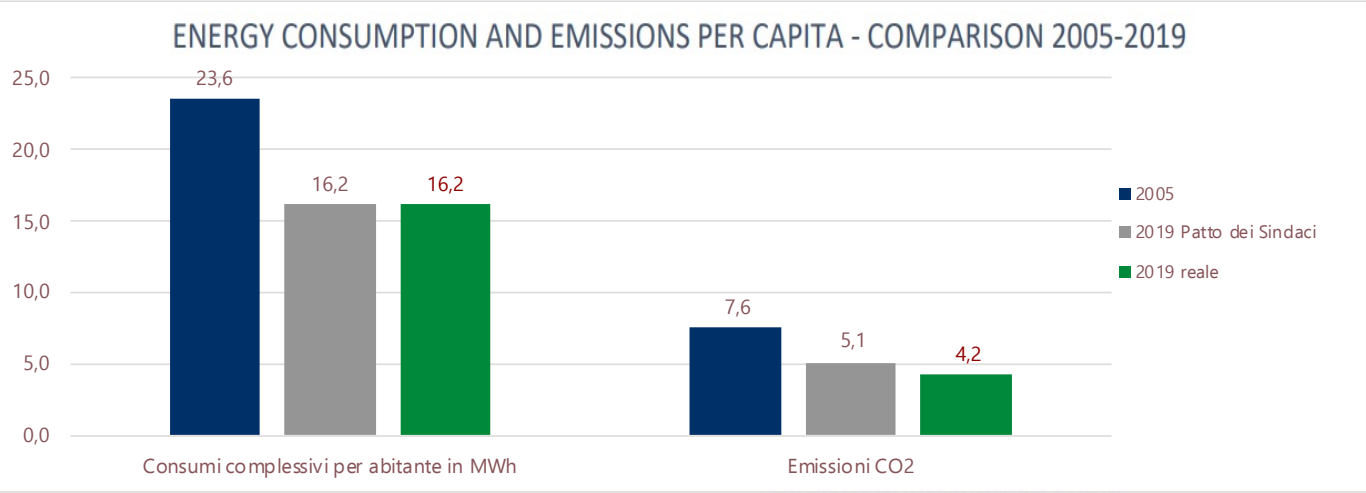
- Guide to steer all the other policy instruments (**master plan**)
- **Continuous communication tool** for implemented activities and objectives already set
- **Living participatory tool** among city departments and stakeholder
- **Coordination instrument** for policies at different level
- Different procedure, **flexible and adaptable** during monitoring (revisions are possible to adapt pathways towards the targets)

Monitoring emissions results at 2019

We regularly evaluate:

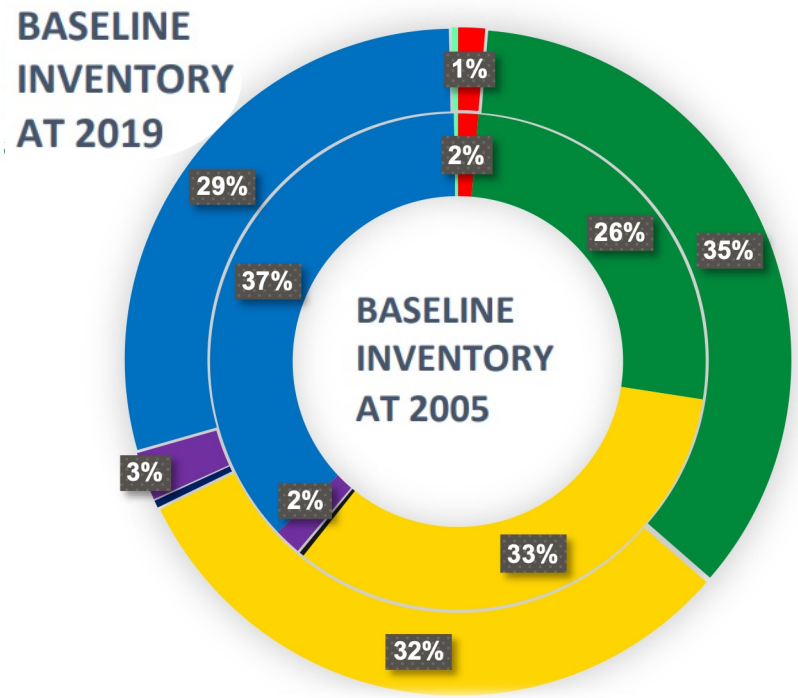
- **The implemented actions set composition and advancement (qualitative annual assessment and holistic KPIs dashboard)**
- **The overall quantitative results achieved** in terms of emissions and consumption savings.

In 2019, the last year before the 2020 target not affected by pandemic, the pro-capite value of the CO_{2eq} emissions has decreased of the **32,7%** following the Covenant methodology (- 44,4% including the national electricity emission factor upgrade supportful for the electrification policies under implementation), overcoming the -21% target fixed by the SEAP for 2020.



QUANTITATIVE MONITORING RESULTS: CONSUMPTION PROFILE PER SECTOR

breakdown of consumption by sector [MWH/year]

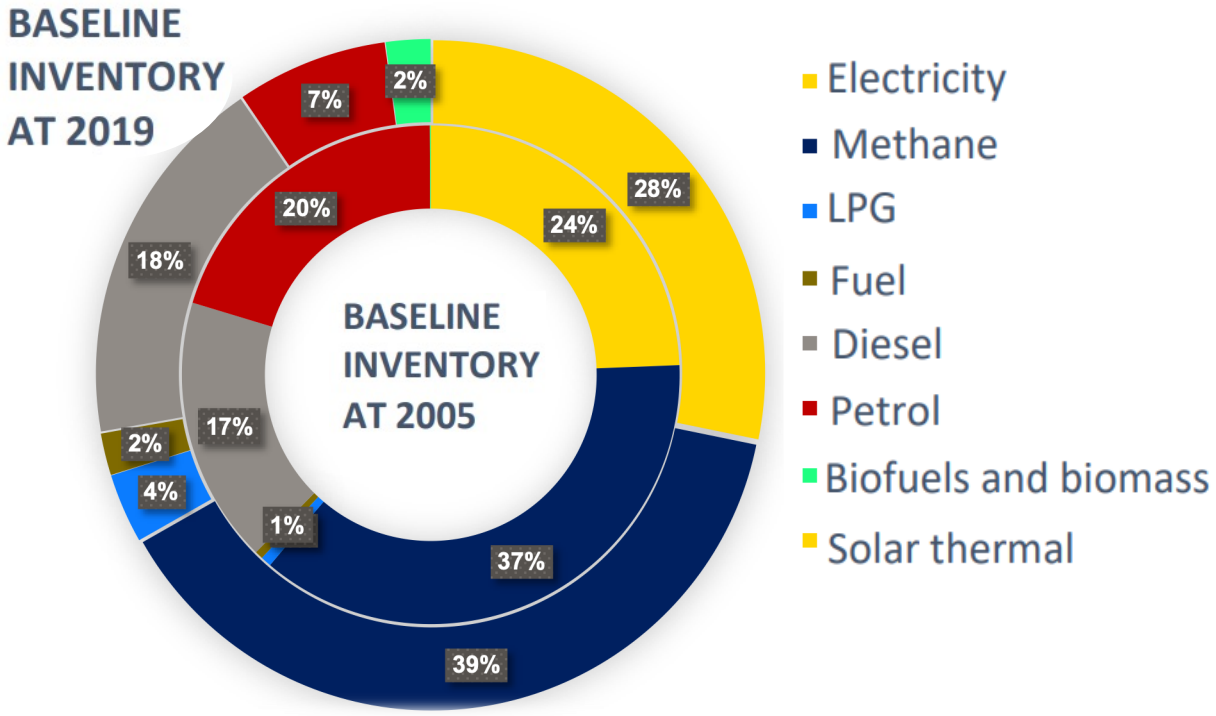


- Public buildings and equipmment
- Tertiary and industry
- Residential building
- Public vehicles fleet
- Agricolture
- Public vehicles fleet
- Public transport
- Private transport
- Waste and water

The energy profile is almost balanced among sectors.
In 2005, the transport sector was the main consumer (37%), now it is the building sector the most impactful thanks to the sustainable mobility actions developed

QUANTITATIVE MONITORING RESULTS: CONSUMPTION PROFILE PER ENERGY SOURCE/VECTOR

breakdown by energy source [MWh]



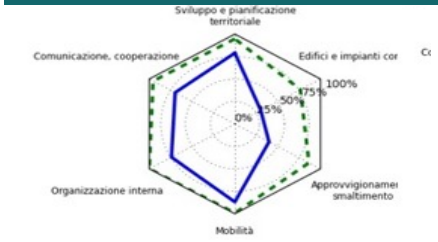
There's a significant reduction of more pollutant fossil fuels (heating gasoline for example) and the use of renewables is increasing in parallel with the electrification policy in both mobility and buildings sector

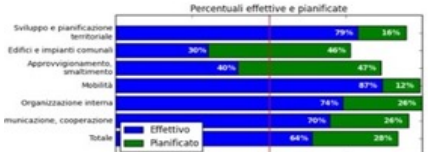
SUPPORT FOR MONITORING

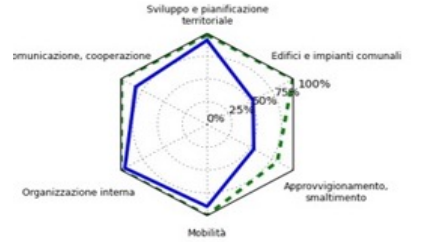
Energy Management Systems for continuous check and improvements

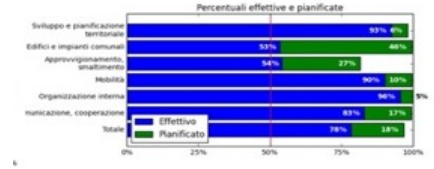
european energy award GOLD

Qualitative assessment of yearly imrovements

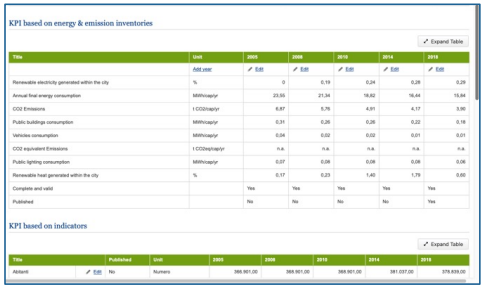




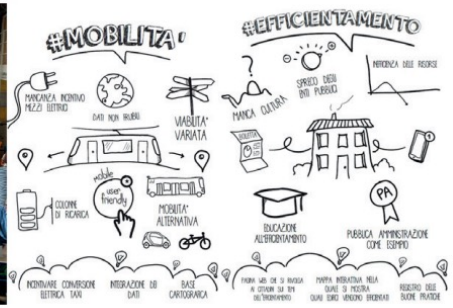




KPIs dashboard

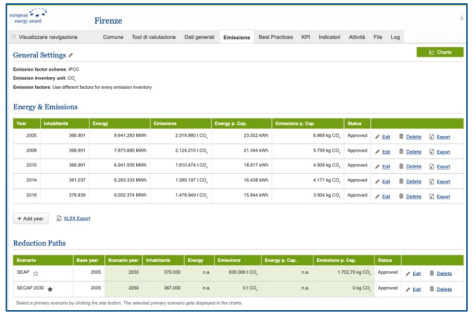


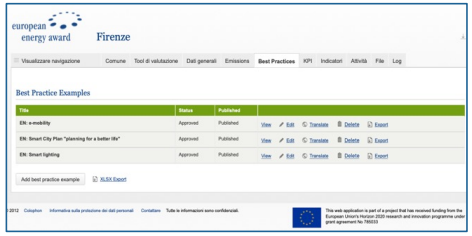
Stakeholders' engagement



Piano di Azione per l'Energia Sostenibile e il Clima

Emission inventories and scenario calculator





OUR NEW 2023 SECAP IN A NUTSHELL

PLANNING

ACTION

COOPERATION

ADAPTATION

PRINCIPLES:	CONTINUITY and COHERENCE of the VISION (multiple commitment)
	PLANS AND SECTORS INTEGRATION
	MULTIPLICITY of ACTIONS
	PARTICIPATION (Co-creation)
	WELLBEING/SOCIAL with citizen at the centre of the transformation

IMPROVEMENTS: **(to better align with other initiatives):**

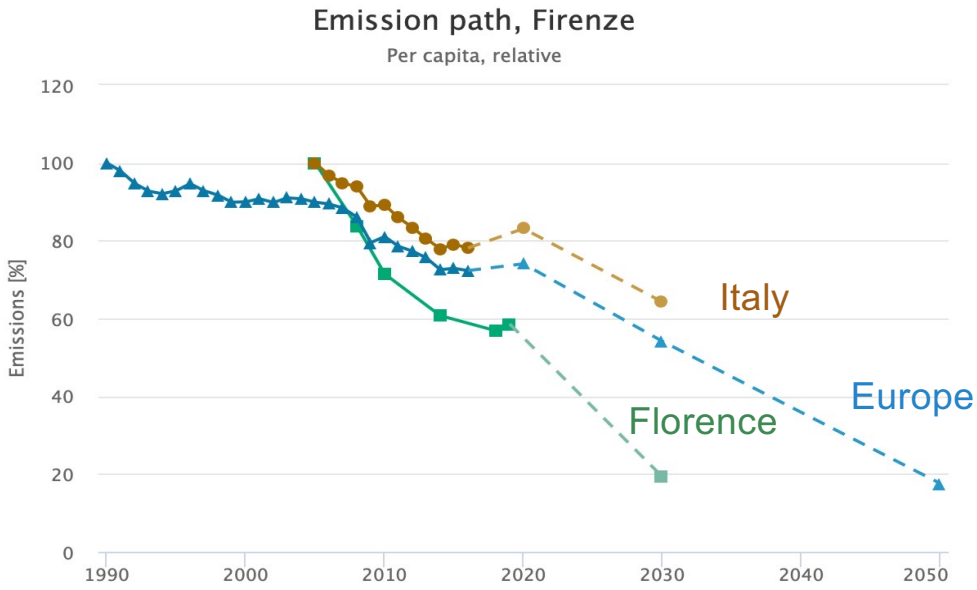
- **$CO_{2\ eq}$ to take into account other Greenhouse gasses**
- **Scope 3 emissions for water and waste management**

SCENARIO AT 2030-50

Impacts foreseen at 2030 Vs 2019 (last monitoring):

39 actions

- ✓ Energy saving: - 1.900 GWh/y
- ✓ More than 380 GWh from RES
- ✓ CO_{2eq} emissions savings : 806.000 t/y
- ✓ Adaptation
- ✓ Energy Poverty



ACTIONS SHEETS TEMPLATE

The following contents have been included in the description of the single measures:

- ✓Titol
- ✓Sector
- ✓Area of influence
- ✓Responsible
- ✓Policy instrument involved
- ✓Implementation period
- ✓New measure of follow up of the SEAP
- ✓State of the art description and implementations planned
- ✓Results expected in terms of consumption and emission savings
- ✓KPIs for monitoring
- ✓Stakeholders
- ✓Funding instruments
- ✓Implementation status (to be started, stopped, started, on-going with results, completed):

- ✓Effects on adaptation or energy poverty
- ✓Effects on planning tools

	PAESC	Scheda **PA-02**
ILLUMINAZIONE PUBBLICA		
SETTORE: PUBBLICA AMMINISTRAZIONE		**AREA DI INTERVENTO:** IMPIANTI - SERVIZI
STRUMENTO DI POLICY: SEAP, SMART CITY PLAN, PIANO COMUNALE DELL'ILLUMINAZIONE PUBBLICA		**SOGGETTO RESPONSABILE:** Comune di Firenze (direzioni Servizi Tecnici, Infrastrutture di Viabilità e Mobilità)
PERIODO: 2020-2025		**AZIONE:** ☐ Nuova ☒ Già inclusa nel PAES

I PROSSIMI SVILUPPI:

Il programma Firenze Cambia Luce, finanziato nell'ambito del PON METRO (azione 2.1.1a) per un totale di oltre 8,5 milioni di euro, ha già ottenuto importanti risultati e verrà portato a compimento su tutto il territorio comunale. La progettazione dell'intervento ha combinato criteri di efficienza energetica con l'ottimizzazione del servizio e della sicurezza stradale. I servizi aggiuntivi installati sull'infrastruttura (videosorveglianza, sensori ambientali, wi-fi...), con risparmi in termini di costi ed impatti paesaggistici, verranno estesi e nuove tecnologie sperimentate per rendere la rete sempre più resiliente ed efficiente.
L'azione riguarda l'illuminazione pubblica nel suo complesso, intervenendo anche sull'efficientamento degli impianti semaforici e dell'illuminazione votiva.

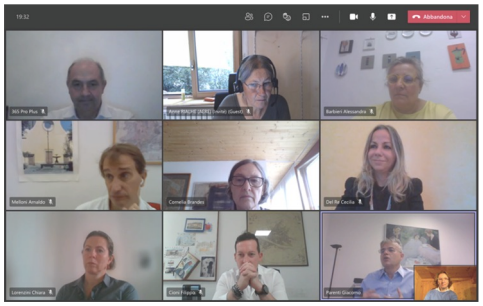
RISPARMIO ENERGETICO (MWh/anno) 3.000	**ENERGIA DA FER** (MWh/anno) -
RISPARMIO DI t DI CO_{2eq} 1.400	**ATTORI COINVOLTI** FIRENZE SMART
STRUMENTI DI FINANZIAMENTO Progetti Europei, PON METRO, Risorse proprie	**INDICATORI PER IL MONITORAGGIO** Consumo MWh/anno, % luci LED, servizi inclusi
AVANZAMENTO DELL'AZIONE: Da avviare / Sospesa o in corso con criticità / In corso / In corso con buoni risultati / Completata o Ampliata	
EFFETTO SU ADATTAMENTO E POVERTÀ ENERGETICA ADATTAMENTO	**RICADUTE SULLA PIANIFICAZIONE ORDINARIA**

INTERNAL ORGANISATION: THE ENGINE OF THE TRANSITION

It was fundamental to have a good and closely cooperating working group since the beginning of the sustainable planning period: with this aim, in 2010 an interdepartmental working group has been formally set up, at the beginning to follow only eea and CoM activities, which has analysed and assessed in detail all data collected, proposing, debating and approving the most suitable measures for the city.

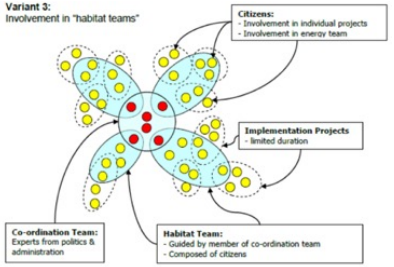
The sectors involved are:

1. General Direction and cooperation depart. (team leaders)
2. Environment Directorate,
2. New Infrastructure and Mobility Management,
3. Technical Services Department,
4. Urban Direction
5. Financial Resources Management
6. Economic Development Department,
7. Communication 22 people + Technical Assistance



The Working Group is now a Climate Task Force (CTF) dynamic and open to face upcoming urban challenges.

The strategy : "***EVERYTHING COUNTS"***
i.e .every suggestion and every sector
The chosen governance model for the interaction with stakeholders foresaw the CTK interacting with several "habitat teams" formed by specific stakeholders. Since citizen is the main target, we refer to, the public debate (as listening marathons, living labs) were the milestones for the acceptance of the activity plan.



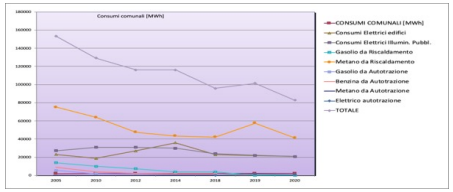
A QUICK OVERVIEW ON WHAT WE HAVE DONE

COMUNE DI FIRENZE

Public buildings & facilities

Playing an exemplar role for citizens, public sector has started to save energy in buildings (schools, public offices, housing, hospitals & health structures ..), and in public lighting: a virtuous path with a target of 50% at 2020 vs 2005 BEI

- Schools (oil boilers displacement, new efficient boilers, PV)
- Hospitals (RES and CHP)
- Sport centres and markets (PV, CHP, electric mobility….)
- Pubblic housing (A label retrofittings, wood buildings, RES, efficiency….)
- Parks (Cascine)
- Water management
- Road cleaning
- GPP and green energy purchase



Yearly program for optimisation and retrofitting

Piano di Azione per l'Energia Sostenibile e il Clima

Best practice:
FLORENCE CHANGES LIGHT program

SMART LIGHTING

30.000 new LED lights with tech equipment to enable innovative services (WIFI, sensors, traffic control, video surveillance…)

100% implemented

- Increased level of security
- More smart services available
- Lower consumption: -40%
- -3.000 t CO_2 per year.

https://firenzecambialuce.it

SERVICES

All services, involving a wider area, have been improved with ambitious targets

Water management

- Consumption savings (-4,5% in 2020)
- Pipe network leaks reduction
- Hydroelectric production with a 2400 kW turbine for a total of 3,5 GWh in 2020, biogas from sewage exploitation
- Communication campaigns to reduce water consumption and for the use of public drinking water (fontanelle)
- Consumption metering and proportional tariffs
- Yearly sustainability balance report publication
- Water safety plan adopted in 2020

Waste management

in cooperation with ALIA spa

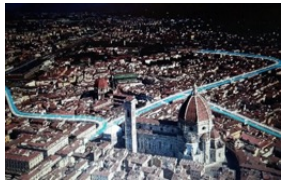
Participatory process
New waste management plan with ambitious targets (75% sorted)
Rewarding tariffs
Optimisation of collection logistic for each district and Smart Waste
Promotion of circular economy

https://www.firenzecittacircolare.it

FIRENZE CITTÀCIRCOLARE

Smart grid

- **100% Smart metering**
- Advanced remote control and automation on the medium-low voltage grid : 2 primary substations and 60 secondary substations (25.000 users involved) to provide additional services and improve resilience
- Number of interruptions per users decreased of the 23% in 2 years
- More than 600 Smart Info devices distributed to increase awareness and actively monitor trends



MOBILITY

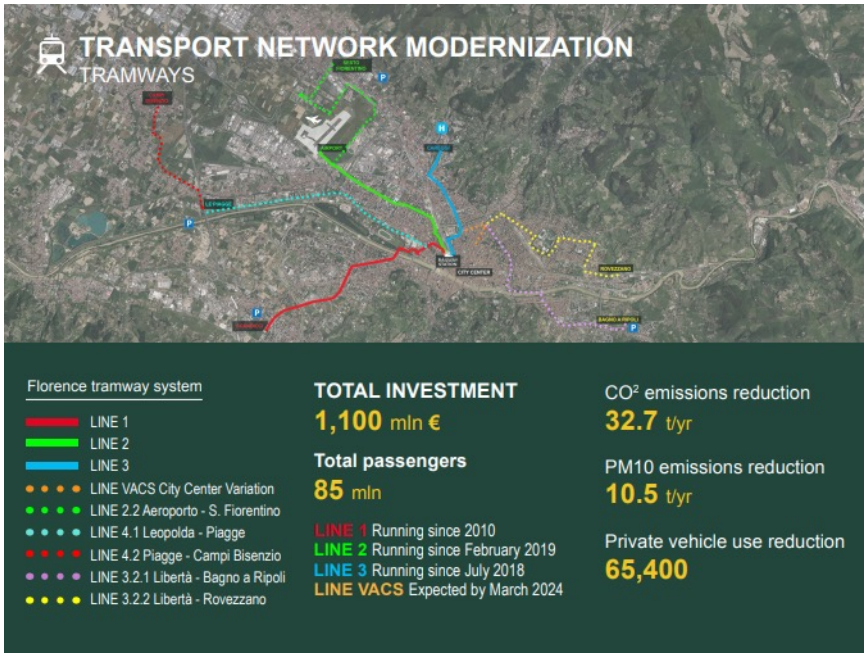
Mobility in Florence was the main sector affecting CO_2 emissions (34%)

TRANSPORT NETWORK MODERNIZATION AND MOBILITY EFFICIENCY: a complex action to reach important targets

- ✓ e-mobility capital
- ✓ Public transport: local rails trams, new bus fleet, e-ticketing and infomobility, various sharing systems
- ✓ Soft mobility: pedestrian areas, bicipolitana
- ✓ parking spaces control, park and ride,
- ✓ advanced intermodality,
- ✓ Information technology: infomobility platform, traffic supervisor, APPs
- ✓ communication campaign

MOBILITY IN ACTIONS: INFRASTRUCTURES

focus on main implementation infrastructures project

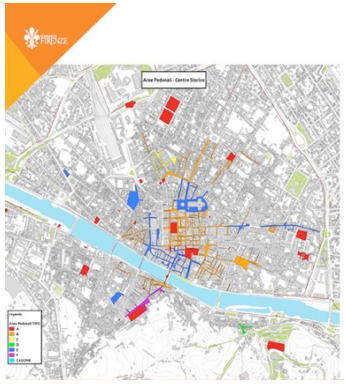


https://mobilita.comune.fi.it/tramvia/sistema_tramviario/sistema.html

Results:
- Public network -180 t CO2/y and a max of 60.000 recharges in 2017 and 2018
- e-taxi action -109 t C02/y
- fast recharging infrastructure: in 2019 >10,000 recharges in a year

MOBILITY IN ACTIONS

PEDESTRIAN AREAS



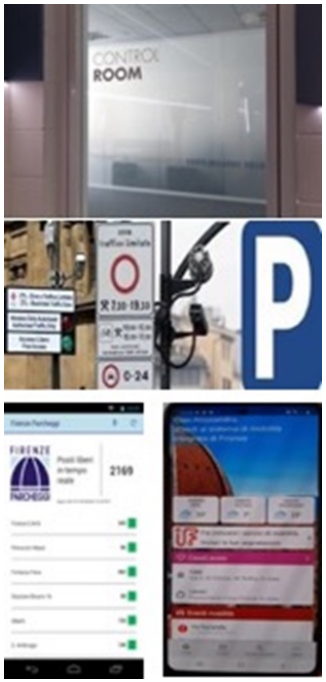
In last years, pedestrian areas have been constantly widened:

- 2009: 260.000 mq
- 2012: 380.000 mq
- 2014: 395.000 mq
- 2016: 400.000 mq
- 2019: 420.000 mq

Covering a total of more than 4% of the whole territory

1,14 mq pedestrian area/inhabitants

MONITORING ICT



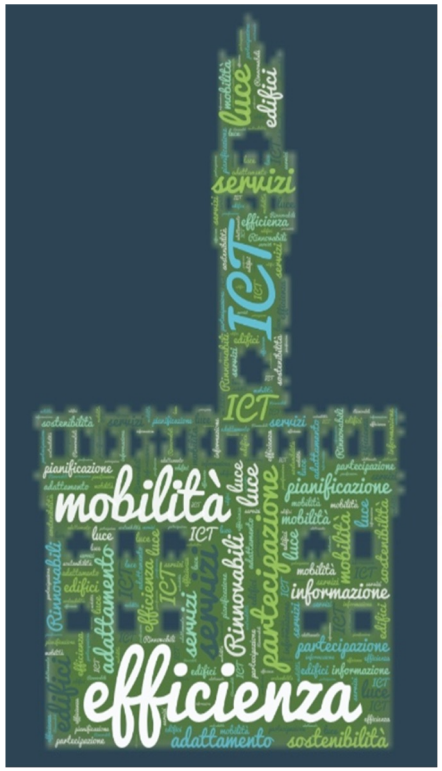
Efficiency in information and communication technologies to support sustainable mobility policies

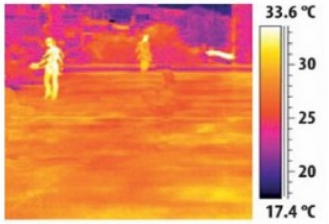
- Smart city control room (dataset and big data managing)
- Traffic supervisor
- Info displays
- real time mobile apps (IF) for intermodality and traffic
- Automated entrance surveillance
- Eco-road pricing IOT reduce traffic and lower pollution
- Parking management

ADAPTATION: ACTIONS STARTED

- Detailed vulnerabilities and risks analysis in line with national and regional plans
- Heat islands / hot spots analysis with the support of the National Research Center - CNR
- River Arno floods measures
- Infrastructure resilience measures
- Green plan

CDP RATING A





Where to find additional information

- Smart Cities Marketplace:
  - Sistemic changes in Governance https://smart-cities-marketplace.ec.europa.eu/insights/publications/systemic-changes-governance-equipping-local-governments-realising-climate
  - Smart Cities Guidance Package https://smart-cities-marketplace.ec.europa.eu/news-and-events/news/2019/smart-city-guidance-package
- Governance model: the interaction with stakeholders (see also Florence's contribution to the "Stakeholders' enagegement guidelines – CoME EAsy project" available on CORDIS at https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5c3b26429&appId=PPGMS)
- The Smart lighting project: www.firenzecambiauce.it
- H2020 SCC1 Replicate project: https://replicate-project.eu
- European Energy Award www.european-energy-award.org and Florence page at https://www.european-energy-award.org/gold-municipalities-new/eea-municipality-detail/firenze

any questions?

Dott. Alessandra Barbieri alessandra.barbieri@comune.fi.it

Eng. Elena Aversa elena.aversa@comune.fi.it

Eng. Chiara Tavella (expert) chiara.tavella.at@comune.fi.it