BAKA
BATI AKDENİZ KALKINMA AJANSI

ANTALYA BÜYÜKŞEHİR BELEDİYESİ

TÜRKİYE CUMHURİYETİ KALKINMA BAKANLIĞI

Demir Enerji DANIŞMANLIK

SUSTAINABLE ENERGY ACTION PLAN ANTALYA

"Antalya Green House Gas Inventory and Sustainable Energy Action Plan" Project of Greater Antalya Municipality has been financed by The Western Meditterannean Development Egency BAKA, under the Direct Support Program TR61/13/DFD.

"Antalya Green House Gas Inventory and Sustainable Energy Action Plan" has been carried out by Demir Enerji Danışmanlık for the Greater Antalya Municipality.

Abbreviations	
ABB	Antalya Greater Municipality
ASAT	General Directorate of Antalya Water and Wastewater Treatment
BEP	Enegy Performance iin Buildings
CoM	Covenant of Mayors
ÇŞB	Ministry of Environment and Urban Planning
ENVER	Energy Efficiency Campaign
MENR	Ministry of Energy and Natural Resources
EE	Energy Efficiency
ICLEI	International Council for Local Environmental Initiatives
IEA	International Energy Agency – Uluslar arası Enerji Ajansı
IEAP	International Local Governmet GHG Emissions Analysis Protocol
IPCC	Intergovernmental Panel on Climate Change
İZODER	İsolation Producer's Association
SEAP	Sustainable Energy Action Plan
UİDSB	National Climate Change Strategy White PAper
YEK	Renewable Energy Law

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1 INTRODUCTION

The Greater Antalya Municipality has signed the European **Covenant of Mayors (CoM)** in 2013, committing to a minimum of 20% reduction in GHG by 2020, first through the initial calculation of the urban GHG inventory and second the formulation of a **'Sustainable Energy Action Plan' (SEAP)** in one calendar year following the signing of the CoM.

Antalya is the first Metropolitan City in Turkey to have undertaken the task of reducing urban GHG by formulating the so called 'SEAP' a trademark of the CoM. In this way Antalya has made a bold move to move forward to create a liveable, climate-friendly city that is respectful of its citizens as well as nature. The plan will also help Antalya in its efforrt to become a 'resilient' city, that can better cope with the unwanted effects of global warming.

The work has been carried out by the generous support of the local development agency BAKA to the Greater Antalya Municipality which has procured the work to Demir Enerji Danışmanlık. The full process of formulating the SEAP, has been accompanied by a series of stakeholder meetings including local goverment and city-wide partricipants. This Summary is a short english language version of the full report prepared by Demir Enerji for the Greater Antalya Municipality.

Details of human–induced global warming, the state of climate science and its latest findings as well as methods and standards of mitigation efforts of cities and local administrations and calculation methods (based on '2006 IPCC Guidelines for National Greenhouse Gas Inventories' of the IPCC and ICLEI, Local Governments GHG Emissions Analysis Protocol) have been fully elaborated in the full report, a summary of which will be shown in this document.

2 Turkey and the City of Antalya

Turkey is a fast growing country and demonstrates very high growth of energy and electricity demand rates, 4-5% and 7-8% consecutively. On the other hand, it is almost completely dependent on foreign fossil fuel imports demanding very large payments for primary energy supply. The figures below demonstrates these high growth rates and breakdown according to primary fuel type.

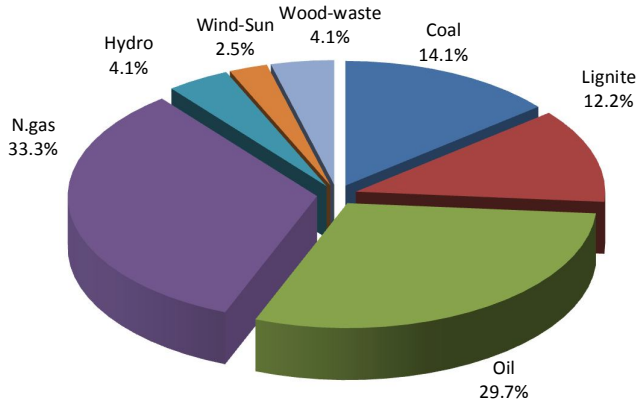


Figure 2-1: Turkey Primary Energy Consumption Change Distribution 2011,%

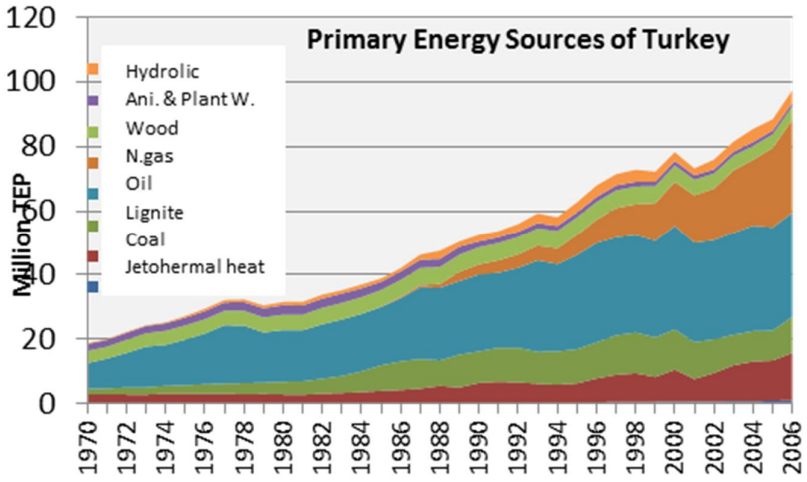


Figure 2-2: Turkey Primary Energy Consumtion Change Distribution 2011, % 1970-2006, %

The GHG emissions in Turkey are energy sector dependent as a consequence of this very high dependence on fossil fuel inputs into the sector. The figure below summarizes GHG emissions in Turkey on a sectoral basis.

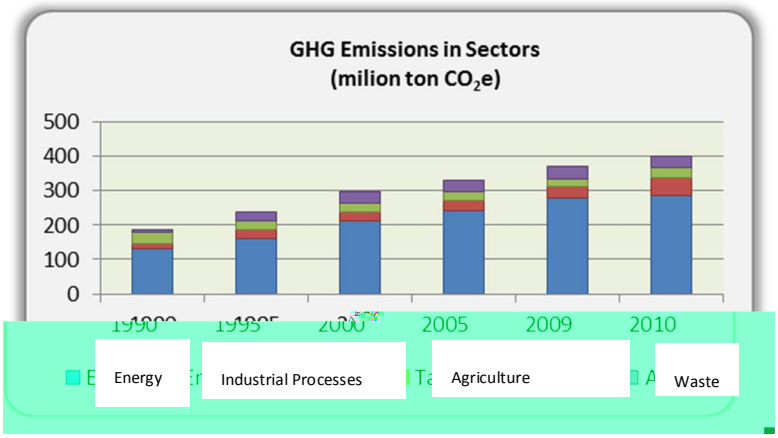


Figure 2-3: Sektörlere göre Türkiye sera gazı salımlarının gelişimi

Türkey has produced a **National Climate Change Strategy White Paper** in May 2010, elaborating its special conditions and short to long term goals in transport, industry, buildings waste and agriculture.

Energy efficiency legislation has a longer history in the framework of EU candidature processes in Turkey, and recent legislation has detailed approaches for energy efficiency in power production, industry and the built environment. Various new instruments and institutions have been legislated including the Energy Sector Regulation Board, Energy Efficiency Coordination Council and the National Energy Efficiency Center.

The document prepared by the Environment and Urban Affairs Ministry includes measures such as;

- Cogeneration and regional heating,
- Local renewables as well as local coal use,
- Building efficiency improvements,

Zero emissions technologies such as renewables and nuclear with local content provisions Amelioration of thermal power plants, lowering of energy intensities to levels of 2004, Increase local renewable contribution to power production to 25%, maximum utilization of industrial sector, energy efficiency 7% reduction in GHG emissions.

Legislative action concerning local renewables development has come some way and wind installations have increased in Turkey.

Solar is particularly important for in the case of Antalya, particularly legislation for distributed solar systems that may have an important place in the decarbonization of the city's power consumption. The figures below shows the Antalya solar irradiation map and potential power production capabilities from photovoltaic installations. One of the important emissions reduction measures as will be seen in the SEAP, is the possibility to install photovoltaic systems on roofs in the city.

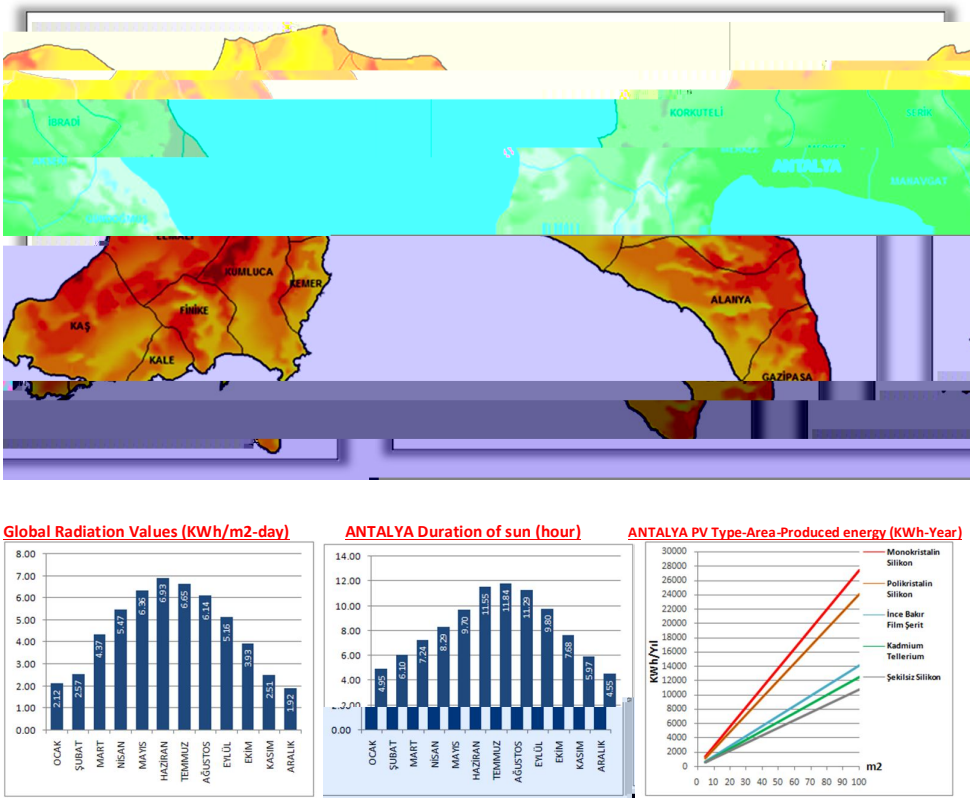


Figure 2-4: Atlas of Antalya Solar Energy Potential, YEGM.

Antalya has a very high proportion of use for solar collectors for water heating already.

2.1 The City of Antalya

Antalya is placed on the south west of the Anatolian landmass, the center of the so called Teke region. It includes the antique regions of parts of Cilicia, Pisidia, Pamphylia and Likia, inhabited for since historical times and now a region rich in with its cultural, physical and modern attributes.

The region is about 2.6 % of the total area of Turkey but has a long coast measuring 640 km. 60 % of the region is covered by forest housing a rich flora and fauna, very significant for the biological diversity of the country.

The climate is Mediterranean with avarage humidity around 64%. Antalya is rich in water resources.

The greater Antalya Municipality or ABB presently includes 5 sub-divisions whose number will increase to 19 with the new Municipal legislation to come into effect in 2014 March. All data and calculations have included the post-2014 situation.

Antalya, due to its importance as a tourist destination and an important green house vegetables production hub, attracts a very large traffic mainly through highways and air due to the absence of railways to the region.

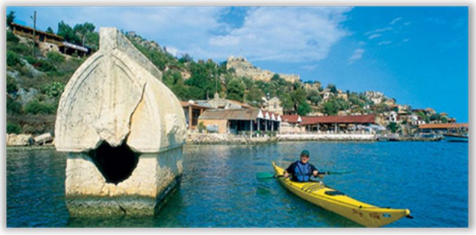
The city of Antalya houses 2.7% of the Turkish population and 75% of regional population. Census results show that Antalya has been the fastest growing urban regions in the country with growth rates much higher than the Turkish avarage (13%).

The social indicators regarding the city are on the avarage better than Turkish median values; women in the workforce, illiteracy, per capita education and health values etc.

Antalya economy is based on the 3 T's, denoting the Turkish words for tourism, agriculture and commerce.

Tourism

Tourism has moved forward starting from meagre beginnings in 1980's to absorbing 40% of tourists to the country. Annual visitors to the city have topped the 11 million mark in 2012.



Tourism thus figures heavily in urban energy consumption with its large mass-tourism facilities in resorts and 4-5 star luxury hotels. Tourism industry attracts a large workforce also with the downside of unemployment during off-season, a major drain also in the city's resources and planning capacities.

Agriculture

Climactic conditions make the city ideal for covered agriculture. Antalya provides most of Turkey with fresh produce during the winter season and is also a large exporter. The other important agricultural products are flowers as an export market and oranges.

From an total of **414.326 hectar agricultural land** in Antalya, 56% is open field agriculture for fruits, glass houses etc. Antalya produced **6 million tons** of agricultural produce in 2011 with 65% vegetables, 20% fruits and 15% crops.

Agricultural workforce has decreased as the services sector has advanced in parallel with tourism and supply, but the city remains on of the important centers of export agriculture in the country

Industry

Although Antalya is the 7th most developed city in the country, industry activity is below national avarage due to the advanced tourism and agricultural sectors. This can be said to save the city from industrial pollution and congestion that can be seen in some other parts of Turkey.

Antalya industry has developed as a supply sector for the tourism and agriculture sectors. 29 % of all industry is foods and beverages, the second industrial sector being mining and non-metallic products. There is one Organized Industrial Zone, OSB with around 230 firms active in it.

Antalya has become a showcase for Turkey with over 11 million tourists, as well as being a developed city with all the character of a modern metropolis. The city is highly sensitive to ecological issues with its young population and the Municipality has a very strong stake in developing a climate friendly city with renewable energy use and livable urban space.

3 ANTALYA Urban Energy Consumption and GHG Inventory

In the inventory the urban emissions of the city as well as the Municipality as a seperate entity has been calculated. This will help the Municipality to become a showcase of demonstration for climate friendly reduction actions. ICLEI has produced a easy to use guide for local administrations that can calculate and then compare urban emissions. The protocol developed for this purpose is the IEAP, which this study has utilized.

The general approach is shown below for climate change mitigations actions for local government.

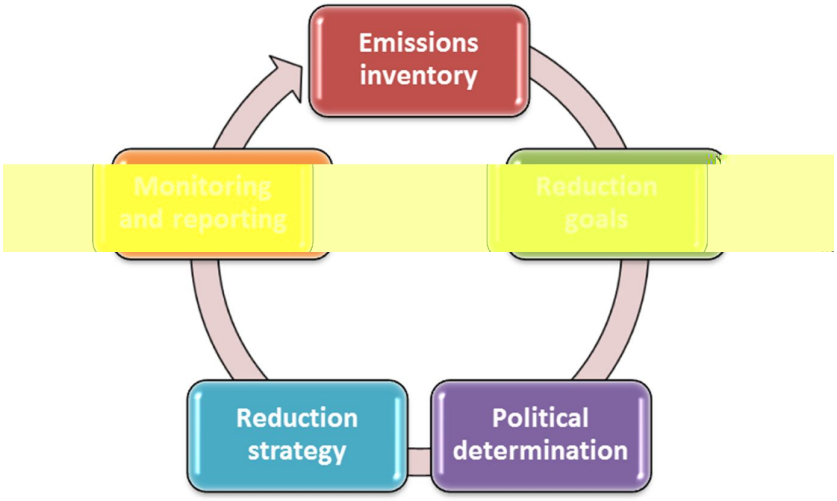


Figure 3-1: ICLEI's SEAP approach

The WRI/WBCSD GHG Protocol has been used but care needs to taken for local attributes.

Administrative boundaries is a complex issue in Turkey that may change in time. Greater Antalya Municipality will include the whole of the province of Antalya after 2014 March therefore, the inventory and SEAP has included all the provinces.

Standard notation and categories have been used in terms of Scopes of the Emissions and these have been explained in detail in the full report.

The reference year is 2012.

The Municipality

All sub-districts have been included in the calculations for the Greater Antalya Municipality (ABB). The newly privatized electric distribution company has reported 10% avarage power losses in transmission for the province, which has been distributed to the sectors depending on their power use.

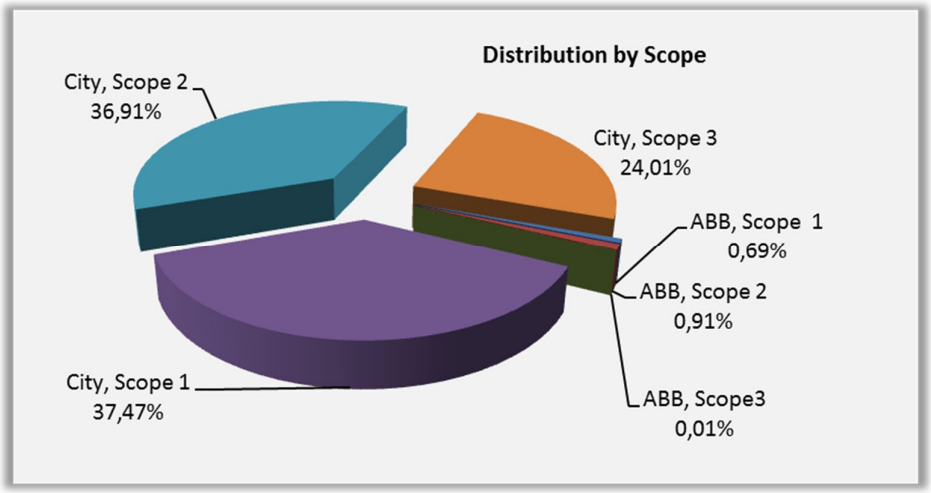


Figure 3-2: Antalya GHG Inventory Distributed by Scopes, 2012

Table 3-1: Greater Antalya Municipality Inventory, 2012

Greater Antalya Municipality, The City Government Inventory					
Category		CO_2	CH_4	N_2O	Total
		tons CO_2e			
Buildings					**10.615**
Scope 1	Stationary Energy Emissions				
Scope 2	Electricity Consumption				10.615
Street Lighting & Traffic Signalization					**67.677**
Scope 2	Electricity Consumption				67.677
Scope 2	Electricity Consumption				
Vehicle Fleet					**3.456**
Scope 1	Transport	3.369	4	84	3.456
Scope 2	Consumption of electric vehiclesi				-
Public Transportation					**62.355**
Scope 1	Public transportation vehicles – Municipality Buses	58.358	50	146	58.091
Scope 2	Public transportation electricity cons.				3.399
Scope 3	Employee Commute	858	1	6	865
Fugitive Emissions					**77**
Scope 1	Refrigerants	77			77
Scope 3 Emissions					
Scope 3	Flights				19
TOTAL					**144.200**

Antalya City GHG Emissions

Total emissions have been calculated as **8.966.179 tons of CO_2e** for the reference year 2012, of which only **144.200 tons of CO_2e** are emitted by the City government ABB as shown in the previous section.

Table 3-2: Antalya Urban GHG Inventory, 2012

City					
Category		CO_2	CH_4	N_2O	TOTAL
		ton CO_2e			
Residential					**1.235.407**
Scope 1	Stationary Energy Emissions	115.373	47	58	115.477
Scope 2	Electricity Consumption				1.119.930
Commercial					**893.828**
Scope 1	Stationary Energy Emissions	92.596	4.844	694	98.133
Scope 2	Electricity Consumption				795.694
Industrial					**644.361**
Scope 1	Stationary Energy Emissions	291.098	7.986	3.029	302.110
Scope 2	Electricity Consumption				342.251
Eligible Consumer					**1.048.444**
Scope 2	Electricity Consumption				1.048.444
Energy Poduction Facilities					**-**
Scope 1	Stationary Energy Emissions	-	-	-	-
Scope 2	Electricity Consumption				-
Vehicles					**4.118.047**
Scope 1	Transportation	1.926.810	1.969	39.180	1.967.573
Scope 3	Transportation – City Bus Station	20.947	24	534	21.505
Scope 3	Air Transport	2.110.378	310	18.300	2.128.968
Solida Waste					**385.010**
Scope 1	CH_4 Emissions		385.010		385.010
Wastewater					**144.233**
Scope 1	CH_4 and N_2O Emissions		118.428	25.805	144.233
Agriculture and Land Use					**352.650**
Scope 1	Enteric Fermentation		300.234		300.234
Scope 1	Fertilizer Management		-		52.416
TOTAL					**8.821.979**

ICLEI standards and CoM practice allow local governments to leave out those emissions that they have no way of controlling and thus reducing. Although emissions from agriculture, industry and particularly air transport have been included in the Antalya inventory, these emission sources are of the category emphasized above and have been left out of the SEAP process.

Table 3-3: Antalya SEAP energy consumption and emissions (those sources to be included in reduction measures)

Antalya	MWh	tCO_2e
Building, Equipment/Facility Enegy Consumptions	**6.583.799**	**3.255.971**
Municipal Building&Facilities	19.967	10.615
Residential Buildings	2.614.546	1.235.407
Other Building/Facilities other than Municipal	1.849.869	893.828
Eligible consumers (hotels)	1.972.117	1.048.444
Street Lighting	127.301	67.677
Enegy Consumption in Transportation	**8.556.095**	**2.054.890**
Municipal's vehicle fleet	14.698	3.456
Public Transportation – Buses	218.559	58.091
Public Transportation – Subway	6.394	3.399
City Vehicles	8.223.543	1.968.438
Transit - City Bus Station	92.901	21.505
Other Emissions	**0**	**529.243**
Disposal of Solar Waste		385.010
Wastewater Treatment		144.233
TOTAL	**15.139.894**	**5.840.104**

The SEAP emissions, those not including categories not controlled by the local government, are **5.840.104 tons CO_2e**. The table above summarizes the sources of emissions. 56% of all emissions are energy consumptions in Scope 1 and 2 . The distribution demonstrates the climactic realities as well as the historical dynamics of the Turkish economy and energy mix. Very high air-conditioner utilization for both heating and cooling is a fact of life and the very low insulation in a hot climate like Antalya opens up the possibilities of high energy efficiency potential in the building stock.

Just over a third of all emissions are from transport, fundamentally dependent on private mobility and highway use. This is also quite typical of urban regions with less developed mass transit applications. Due to its dependence on infrastructure requirements and citizen behaviour, redutions in this sector are more difficult and require political decisions.

The pie chart below summarized the city's emissions in various Scopes.

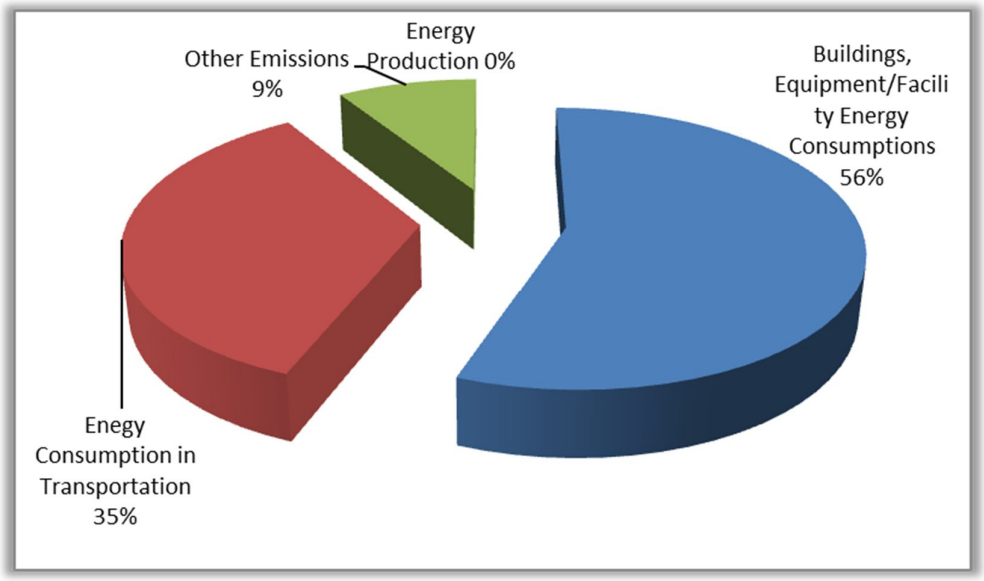


Figure 3-3: Antalya urban emissions distribution,%

4 ANTALYA Sustainable Energy Action Plan (SEAP)

Antalya is a dynamic and highly attractive city on the meditteranean coast of Turkey. It has been and continues to be attractive because of its wealth creation capabilities in the service sectors mostly connected to tourism as well as its position as a center for winter agricultural production hub. These attributes have brought with it high urban migration rates, unplanned urbanization, physical agglomeration and congestion, difficult transport problems and concomitant degeneration of the local habitat and threats to biodiversity. Urban problems in Antalya are similar to all fast growing cities in Turkey as well as all cities and urban regions in the developing world. The lack of timely infrastructure investment and long term planning make these problems enigmatic and hard to solve for perennially fund hungry growth. The urban problems pertaining to Antalya have been elaborated and discussed by many stakeholders and organizations of the city and elaborated in detail elsewhere (see references). The GHG emissions distributions of Antalya city bear the marks of the post-80's urban development of Turkey; automobiles, migration, income inequalities and regional differentiation.

SEAP's are excellent tools to calculate and register urban energy and GHG patterns, and a good start in learning long range planning and energy flows management. Antalya shows particular patterns in emissions sources distribution that also point out to its position in the Turkish economy vis a vis tourism and agriculture. But these particular attributes also point out to niche areas where the low carbon economy can be nucleated. The sun as both a bonus and curse, as a source of income and something to keep away from, is a defining resource for a city such as Antalya. The massive solar resource of Antalya poses an excellent opportunity to power a low carbon future based on local renewable and distributed resources.

SEAP actions summarize various measures in all sub-sectors of the urban inventory. Various sources have carried out studies elaborating future development parhways for the urban region. Notable studies by the regional development agency (BAKA) and the Antaya Chamber of Industry and Commerce (ATSO) have been used for forecasts. The natural energy efficiency declines in the Turkish economy via technological developments and enforced standards has been taken into account regarding energy use and emissions forecasts for Antalya. Antalya population is forecast to increase to 2.485.000 by 2020 at a rate of 19%. Total emissions have been calculated reach **6.450 bin tons CO_2e** with a business as usual scenario. The SEAP predicts 23% reduction to 1.982 bin ton CO_2e , via reduction measures in 6 main categories.

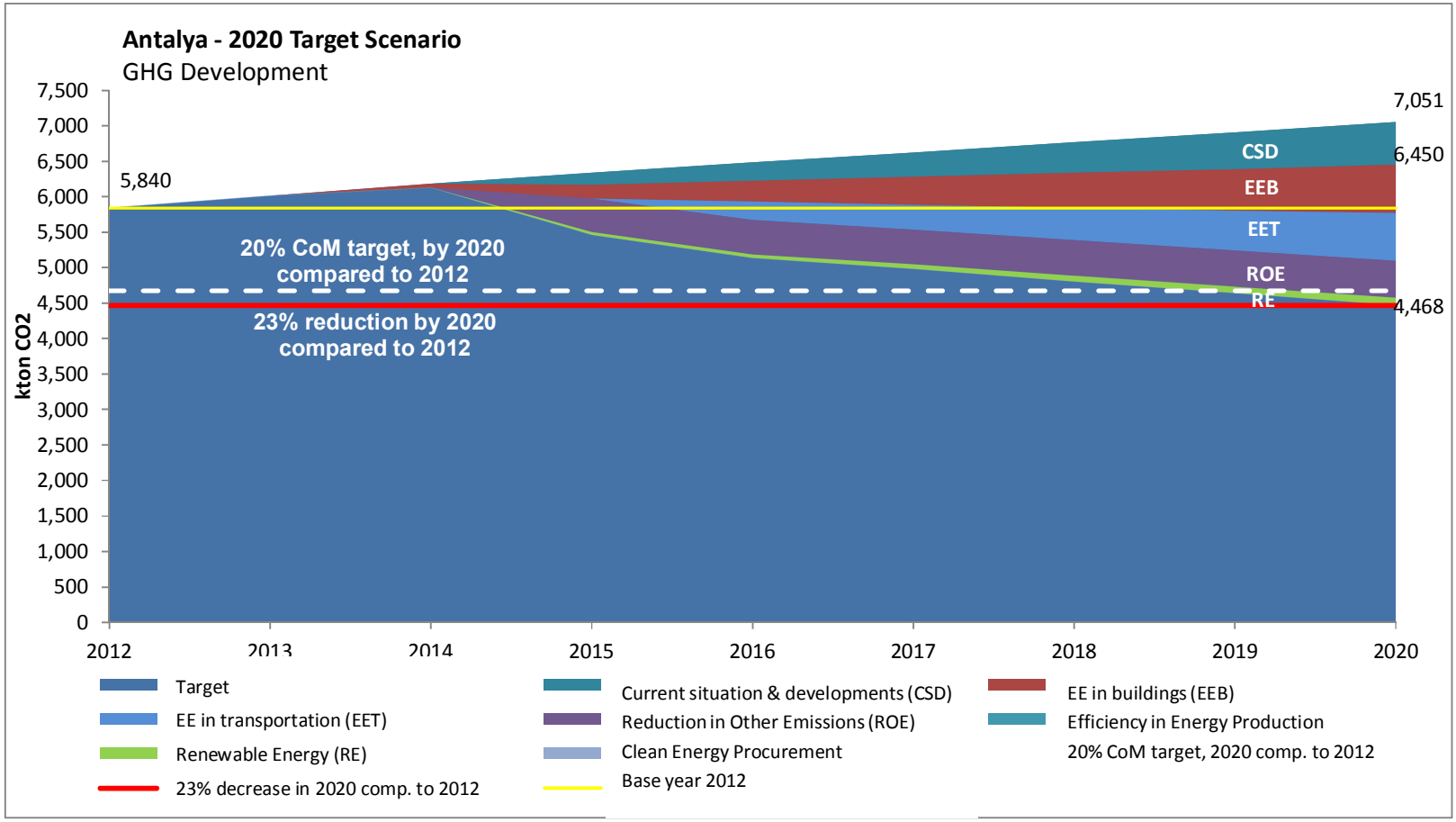


Figure 4-1: Antalya 2020 Emissions and Reduction Scenarios

GOALS, TARGETS, ACTIONS

Table 4-1: Emission reduction summary table

SPATIAL DEVELOPMENT – BUILT ENVIRONMENT					
Goal K1: Energy efficient new development planning	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action K1.1: Urban transformation in residential areas	2015-2020	ABB, ÇŞB, ETKB, İZODER, ENVERDER, Contractors, Financial institutions Urban and Regional Planning, Chamber of Architects	144.000.000	196.369	54.728
Action K1.2: New development in Kırcami	2015-2020		399.600.000	367.823	102.512
Action K1.3: Minimum EE standards in permitting procedures for new construction.	2015-				
Goal K2: EE renovation in standing residential buildings	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action K2.1: Insulation in standing residential buildings	2014-2020	Home owners, insulation material manufacturers, application firms, İZODER, ENVERDER, professional associations, financial institutions, MENR	689.253.684	151.491	71.477
Action K2.2: RE in standing residential buildings	2015-2020				
Action K2.3: EE lighting in standing residential buildings	2014-2020		6.600.000	109.584	58.259

Goal 3: EE renovaiton in standing commercial buildings	Timeline	Related Organizations	Average Cost (TL)	Energy consumption reduction (MWh)	CO_2e Reduction (ton)
Action 3.1: Insulation in standing commercial buildings	2014-2020	Users of commercial buildings, ATSO, MENR, Governor's Office, Provincial Administration, insulation material manufacturers, application firms, financial institutions	117.600.000	174.625	88.128
Action 3.2: RE in standing commercial buildings	2015-2020				
Action 3.3: EE lighting in standing residential buildings	2014-2020			80.159	42.615
Goal 4: Energy Efficiency in Municipal Buildings	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action K4.1: Insulation in standing municipality buildings	2014-2020	ABB, Town Municipalities, District Municipalities, ENVERDER, İZODER, MENR, financial institutions, funds, development agencies	90.000.000	7.987	4.246
Action K4.2: RE in standing municipality buildings	2015-2020		6.000.000		1.994
Goal K5: Energy Efficient street lighting systems	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action 5.1: EE street lighting systems	2014-2020	ABB, District Municipalities, Governor's Office Provincial	102.000.000	91.657	48.728

Action 5.2: PV integration to street lighting systems	2014-2020	Administration, manufacturer's of EE lighting, financial institutions, MENR, funds, development agencies	13.099.333	5.614	2.985
TOTAL			**1.568.153.017**	**1.185.309**	**475.672**

TRANSPORTATION					
Goal U1: Mass transit	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action U1.1: Bus Rapid Transit Lines to carry 10% of urban passanger load	2016-2020	ABB, Antalya Transport A.Ş., Ministry of Transport, financial institutions, citizenS	1-5 milyon $/km	474.134	114.120
Action U1.2: City Center-Airport Light Rail System	2018-2020			38.248	11.618
Goal U2: Pedestrian and Cycling modes penetration in transportation and mass transit integration	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action U2.1 Cycling to increase from present < 1% to 10%	2016-2020	ABB, Regional Directorate of Highways, universities, schools, MoE, commercial buildings, citizens	3.197.880	477.493	114.210
Action U2.2 Pedestrian transport to increase from present 30% to 35%	2016-2020		2.389.622	318.090	70.283

Goal U3: Alternative technology and fuel use	Timeline	Related Organizations	Average Cost (TL)	Energy consumption reduction (MWh)	CO_2e Reduction (ton)
Action U3.1 CNG fuel transition in mass transit vehicles	2015-2020	ABB, Ministry of Transport, financial institutions, citizens,	2.018.250	28.850	7.668
Action U3.2 Measures to increase urban use of EV	2015-2020		215.500	1.542	327
Action U3.3: Low investment smart management in traffic	2016-2020			1.468.106	351.415
Action U3.4: Connecting Antalya to the National Fast Rail Grid	2020 sonrası				
TOTAL			**7.821.252**	**2.806.463**	**669.641**

RENEWABLE ENERGY					
Goal YE1: Renewable Energy Applications	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action YE1.1: RE applicaitons in hotels	2015-2020	MENR, General Directorate of RE, hotels, farmers, commercial buildings with wide roofs, MF, RE investors, financial institutions			
Action YE1.2: Solar and Wind Power Plants and electricity produciton from renewables					
Action YE1.3: Installing solar energy systems for agricultural irrigation	2015-2020		25.133.000	29.000	15.417
Action YE1.4: PV applicaitons on building roofs	2015-2020		200.000.000	150.000	79.745
Action YE1.5: Energy production of biomass from forest and agricultural waste	2015-2020				
TOTAL			**225.133.000**	**179.000**	**95.162**

SOLIDA WASTE and WASTE WATER MANAGEMENT					
Goal AA1: Solid Waste Storage Areas	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action AA1.1: Kızıllı Municipal Waste Management - Landfill gas and energy production	2015-2020	ABB, District municipalities, financial institutions, companies converting landfill gas to energy			288.391
Action AA1.4: Implement technological waste management systems to all wild landfills .	2015-2020		540.000		159.068
Action AA1.3: Flame land fill gas in other solid waste sites (burning)	2015-2020				
Goal AA2: Wastewater Treatment Facilities	**Timeline**	**Related Organizations**	**Average Cost (TL)**	**Energy consumption reduction (MWh)**	**CO_2e Reduction (ton)**
Action AA2.1: Improving operation conditions of all wastewater treatment plants.	2015-2020	ABB, ASAT, District municipalities			85.623
TOTAL			**540.000**	**0**	**533.082**

SERVICE INDUSTRY

Goal H1: Energy efficient systems	Timeline	Related Organizations	Average Cost (TL)	Energy consumption reduction (MWh)	CO_2e Reduction (ton)
Action H1.1: Use of energy efficient systems in central district hotels	2015-2020	ABB, oteller, turizm birlikleri, finans kuruluşları	30.419.040	63.373	33.691
Action H1.2: Use of energy efficient systems in other district hotels	2015-2020			179.557	95.458
TOTAL			**30.419.040**	**242.930**	**129.149**

AWARENESS CAMPAIGNS

Goal B1: Energy efficiency campaigns	Timeline	Related Organizations	Average Cost (TL)	Energy consumption reduction (MWh)	CO_2e Reduction (ton)
Action B1.1: Operate information points within the municipality	2014-2020	ABB, İlçe belediyeleri, vatandaşlar, araç sahipleri, nakliye şirketleri, tüketici dernekleri	600.000	83.087	44.171
Action B1.2: Organize events on energy efficiency throuhout the city	2014-2020		100.000	65.484	34.814
Action B1.3: Organize Eco-driving trainings (especially for taxi, public transport, waste collection vehicle drivers,...)	2014-2020				
TOTAL			**700.000**	**148.571**	**78.985**

TOTAL	**1.832.766.309**	**4.562.273**	**1.981.691**

5 Conclusions

Greater Antalya Municipality has initiated a process by signing the Covenant of Mayors which is far more than a technical document regarding energy and emissions in the urban space. SEAP process is a novel tool to start the integration of classical city planning practices with urban energy planning. Although climate change is the obvious reason for the emergence of emissions inventory reduction, it creates an excellent opportunity for especially developing country local governments to rejuvenate the urban planning imperative. The SEAP process has greatly benefited from two documents that have been prepared by the Antalya local government; the Transport Master Plan (Kentiçi Ulaşım Ana Planı, recently prepared, and the City Plan (Nazım İmar Planı). These documents as visions of the future of the city until 2030, a city that is livable, a city that protects its natural resources and a city that bases its transportation on pedestrian modes and cycling that are integrated to mass transit, have supported the SEAP actions greatly.

Local governments in Turkey can play a much larger role in climate change mitigation in the country, mixing local historical know-how with modern technology, taking advantage of the fast developing technological frontier enabled by information tehnologies. As clean and climate friendly distributed power generation fundamentally transforms the energy supply architecture of whole nations and regions, Antalya is in an excellent position to power its development via local renewables with solar in the forefront. Local participation, a fundamental attribute of SEAP's worldwide, enhance the potential effectiveness of climate friendly development all over the world and as Antalya as well as other cities in Turkey learn from worlwide best-practive in the integration of city planning with energy planning, Antalya will evolve to become a 'better' home for its inhabitants as well millions that visit.

The administrative dimensions of long range SEAP measures also necessitate a word of caution. Local governments in Turkey are presently ill equipped to carry out medium to long range sustainability programs. Local election timelines and the various social, economical pressures on loccal governments tend to dictate short termism in municpalities. The ever changing tide of local versus central authorization, mostly a result of political reasoning, particularly in spatial planning procedures, makes stable urban policy a far alternative. As an urban transformation tool mobilizing all sectors of the urban economy, triggering new externalities via the creation of new sectors for employment and value creation, and involving a common vision of a desirable future, SEAP's can be utilized for long term stability in local government. The key here is the adoption of SEAP's by the local population, all stakeholders of the city. The most succesfull examples have almost always involved creation of dedicated departments or divisions within the local administrative apparatus to carry out this long range monitoring, management and reporting. Public participation and awareness needs to be maximized through specially created programs.