What use is the SEE 2050 Energy Model to policy makers in the region ?

Energy Community Parliamentary Plenum

Brussels, April 25th 2017

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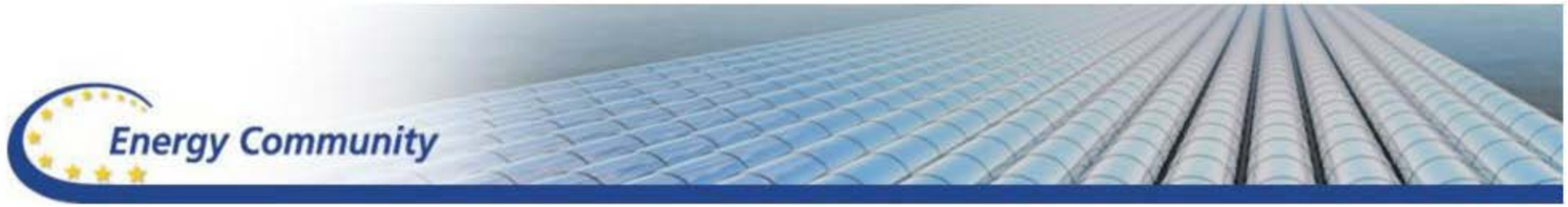
South East Europe Sustainable Energy Policy



EU Parliament defines Energy Community as integral part of the Energy Union and pivotal arm of EU's external energy policy

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WHAT ARE THE KEY EU ENERGY TARGET...?

- EU Target is to reduce GHG Emissions by 80% by 2050 based on a 1990 baseline
- The interim EU Target is to reduce GHG Emissions by 40% by 2030 based on a 1990 baseline

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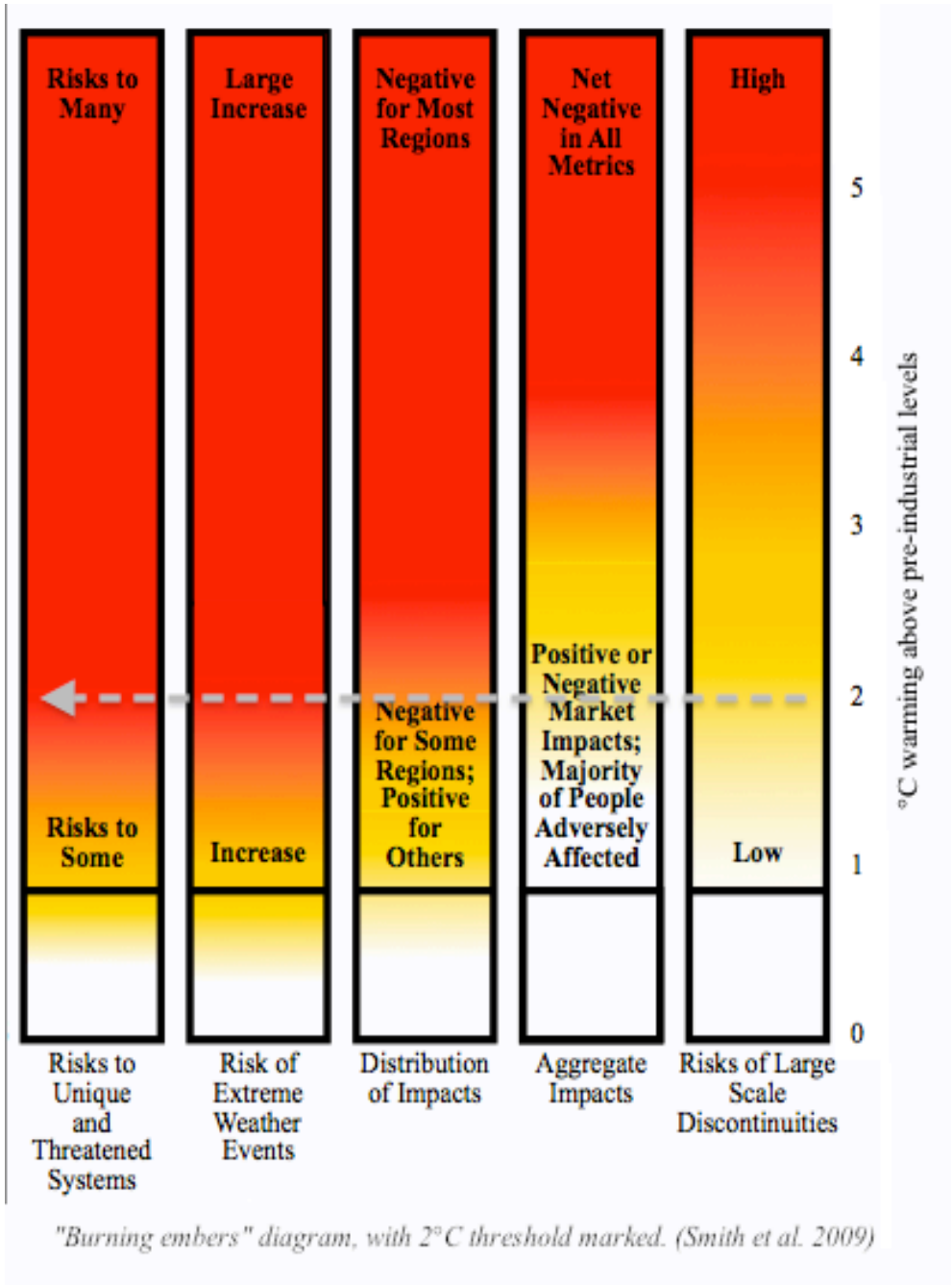

"Burning embers" diagram, with 2°C threshold marked. (Smith et al. 2009)

Intended Nationally Determined Contributions (INDCs) at the heart of Paris agreement do not yet add up to a 2-degree limit, much less a 1.5-degree limit. And our region includes some of the greatest offenders.

Country	*INDC* (% reduction by 2030.)	Baseline scenario	Deviation compared to 1990. (%)	Deviation compared to 2012. (%)
Albania	-11.5	BAU	-55	-26
Bosnia and Herzegovina	-2	BAU	+18	+10
Macedonia	-30	BAU	+22	+11
Montenegro	-30	1990	-30	+9
Serbia	-9.8	1990	-10	+11

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Estimated health costs in SEE from planned and existing plants

8,561 EUR Million per annum (upper range limit)

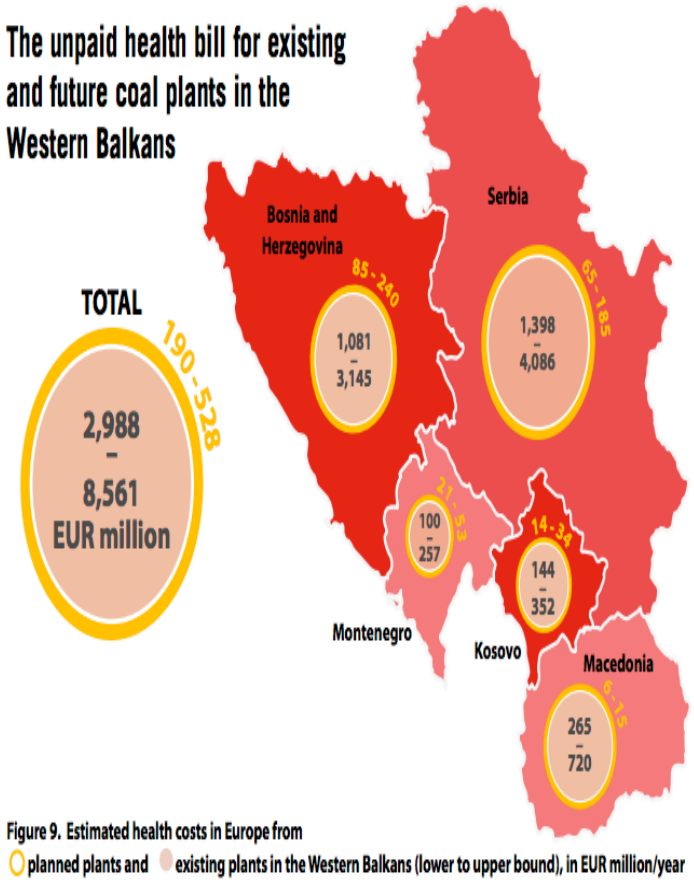

Figure 9. Estimated health costs in Europe from planned plants and existing plants in the Western Balkans (lower to upper bound), in EUR million/year

*Data from report The Unpaid Health Bill: How Coal Plants in the Balkans Make Us Sick, March 2016

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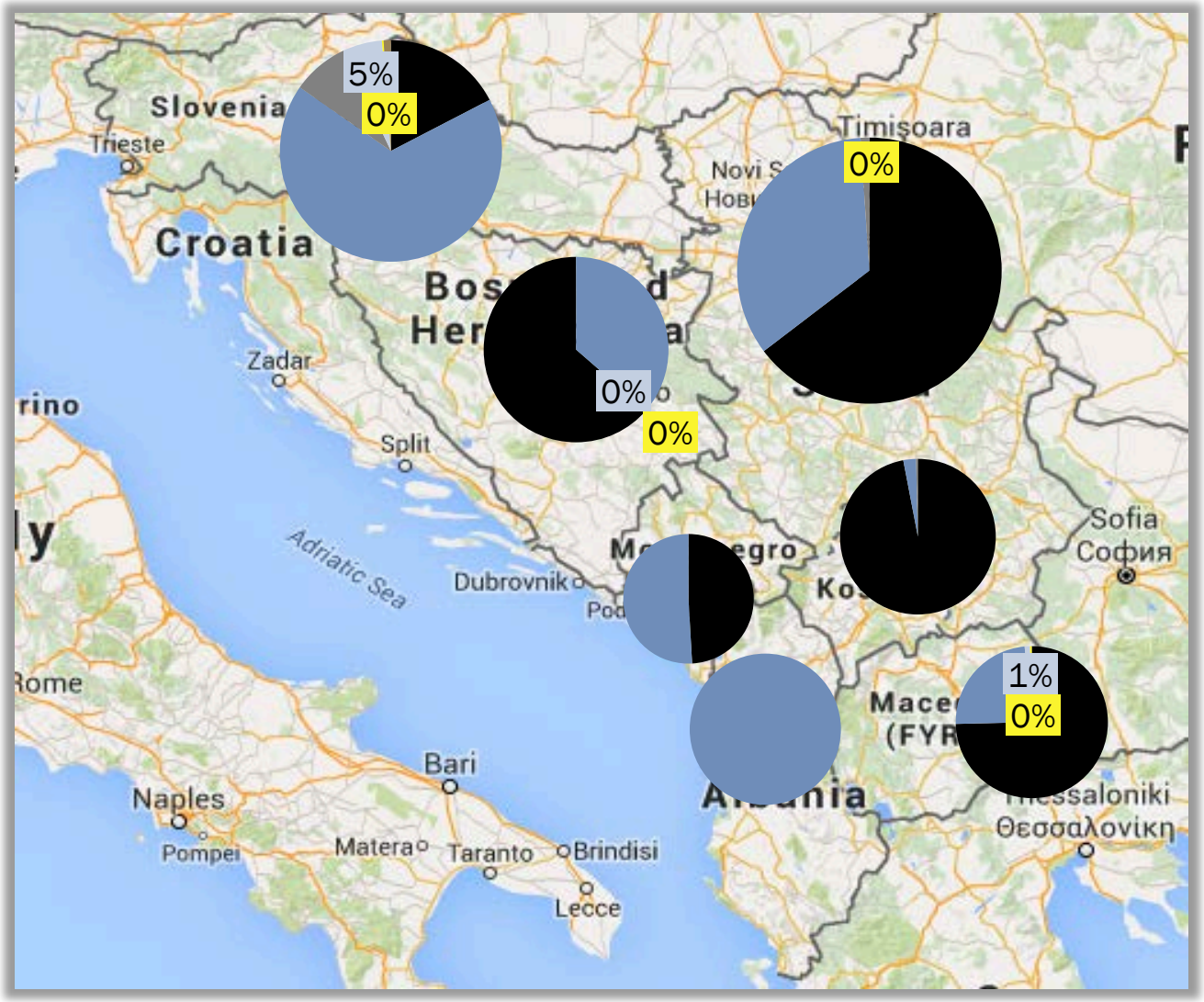
Is the challenge of transforming our region “Mission Impossible”?



We asked ourselves key questions

Is it really possible to meet EU targets with so many challenges ?

How long would it take…could it really be done by 2050?

How much would it cost?

How could we check if this using a fact based approach?

Sources: IEA 2014 data

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SEE SEP

The main objective of the SEE SEP project is a *fact-based dialogue* with *key decision makers* to influence policy and practice for a more sustainable energy system in South East Europe, aligned with key EU Policies and Directives

Energy Community

SEE 2050 Energy Model

Data Collection 2013 -2014

- Development of SEE Low Carbon Roadmap
  - Analysis of demand and supply sectors
  - Dozens of reports
  - Hundreds of expert meetings
  - Tens of thousands of data points
  - 7 national and 1 regional model

Consultations and Call for Evidence 2015

- Cross checking and calibrating of data and assumptions:
  - Sectorial Consultations 220 experts/policy people
  - Call for Evidence 500 contact points
  - Web visits 1,000
  - Call for Evidence Review published mid 2015

Energy Community hosting of web based interface and video game

- Launch of technical model
- Launch of video game

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SEE 2050

Speak now or forever hold your peace…

Over 1,500 individual consultation responses

Presentations in Brussels and Vienna as well as Tirana, Sarajevo, Zagreb, Pristine, Skopje, Podgorica and Belgrade

Agreed to be hosted by Energy Community Website

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Coalition Building

SEE CHANGE NET FOUNDATION

South East Europe Sustainable Energy Policy

MEP JERZY BUZEK

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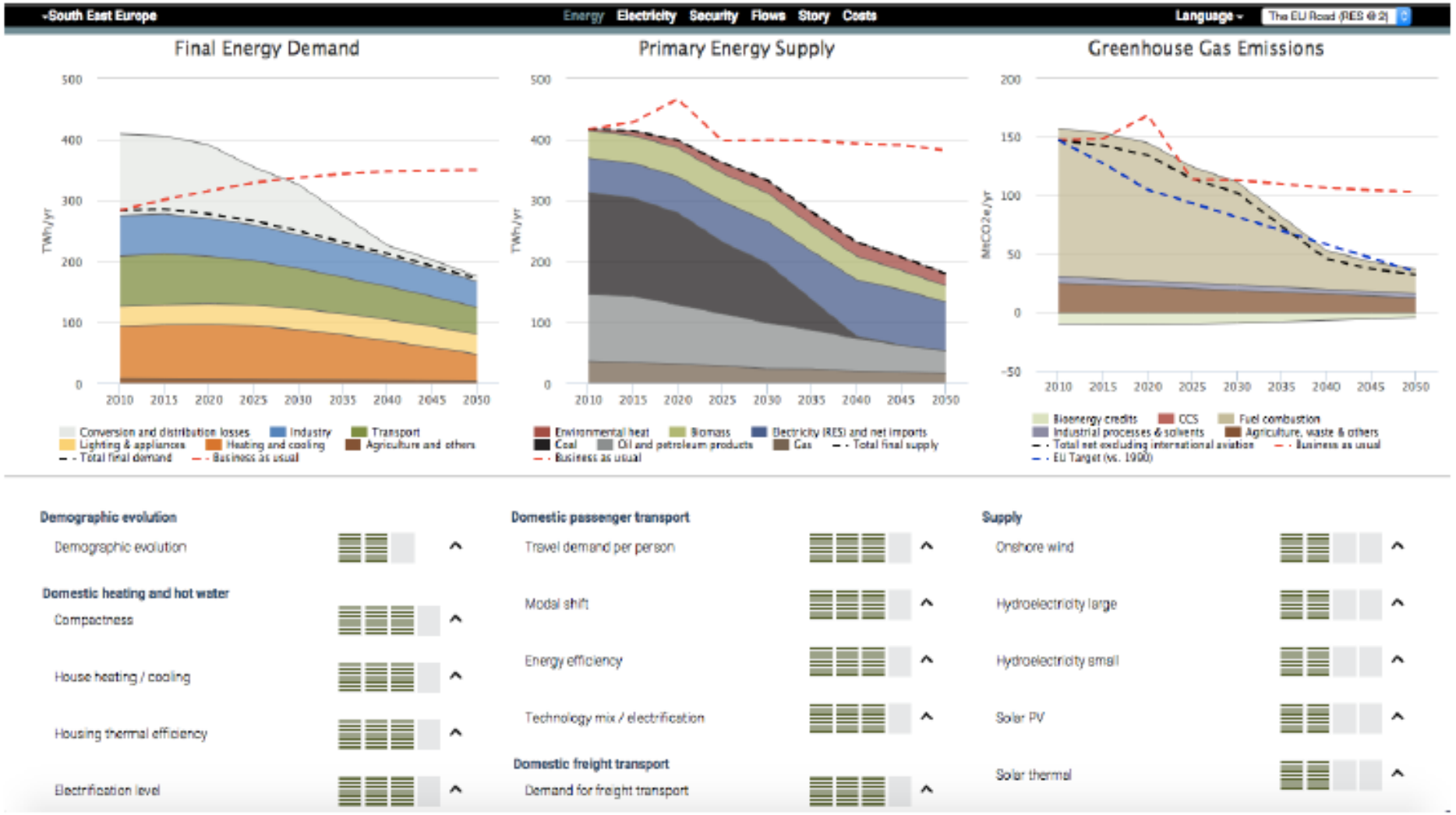
SEE 2050 Energy Model - Tier 2



7 Models, One for Each Country

One regional interactive model

Demand Levers 28

Supply Levers 14

Designed to engage policy makers

Agreed to be hosted by Energy Community Website

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SEE 2050 Energy Model - Tier 2

7 Models, One for Each Country

One regional interactive model

Demand Levers 28

Supply Levers 14

Designed to engage policy makers

Agreed to be hosted by Energy Community Website

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2050

How much can change between now and 2050?

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The “Yes We Can” Moment

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The Balkans Does It First!

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EUCALC

EUCALC Partners:

PIK Potsdam-Institut für Klimafolgenforschung

Imperial College London

CLIMACT

BPIE

ÖGUT

University of Copenhagen

EPFL École Polytechnique Fédérale de Lausanne

UEA University of East Anglia

PPIS Pannon Pro Innovations

Climate Media Factory

T6

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TU Delft

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Which way to go?

- How much energy can we supply from different technologies?
- How much energy do different sectors use and how can we change this?
- What is the cost of different energy pathways?
- Which sectors are the ones we should focus on? Which are less important?
- How can we achieve emissions targets?
- What impact would different pathways have on our air quality and land area?
- What could happen to our energy dependency and security?
- What technology options are publically acceptable?

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The way the 2050 SEE Calculators work

Sectors and drivers

Sector	Example of drivers
 **Supply**	Technical potential of different technologies, capacity factors, etc.
 **Buildings**	floor space per household, single family and multi-family dwellings, indoor temperature, renovation an d performance of new buildings, etc.
 **Transport**	passenger kilometers by private cars or by public transport, mode shift, fuel and vehicle efficiency, etc.
 **Industry: Cement, Steel, Aluminium**	tons of steel production, production process, carbon intensity, etc.
Agriculture and waste	Waste collection, reuse and recycling, waste to energy, etc.

Levels of effort, from zero to hero

Level 1	Level 2	Level 3	Level 4
No effort (but not a business as usual)	Effort described by most stakeholders as achievable	Effort needing significant change – hard but deliverable	Maximum possible due to physical/ practical constraints only

Each level has been set by consulting with stakeholders.

Sources: SEE 2050 Calculator, https://www.see2050carboncalculator.net/2050/see/Energy.php

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Trade-offs and synergies that can be explored using the SEE 2050 Calculators:

- At present, high energy intensity and low efficiency across sectors, offers a great potential for energy savings; Energy efficiency as First Fuel
- There is a vast potential in renewable energy sources, solar and wind in particular, of which only a small portion is used today; Decisions and investments made now will determine the energy sector in the coming decade and either lock or take the SEE away from carbon intensive technologies
- Low carbon development is technically possible and can be cheaper than business as usual path

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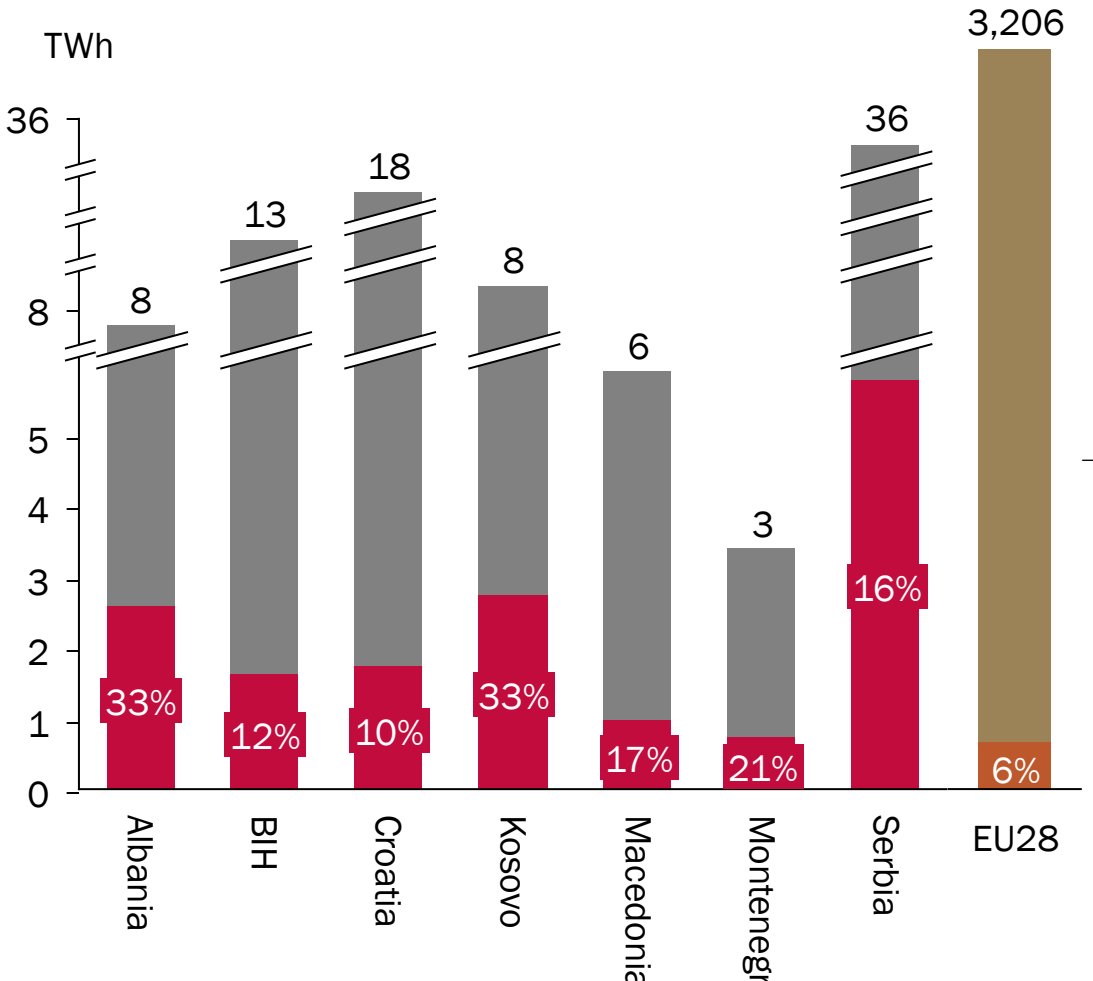
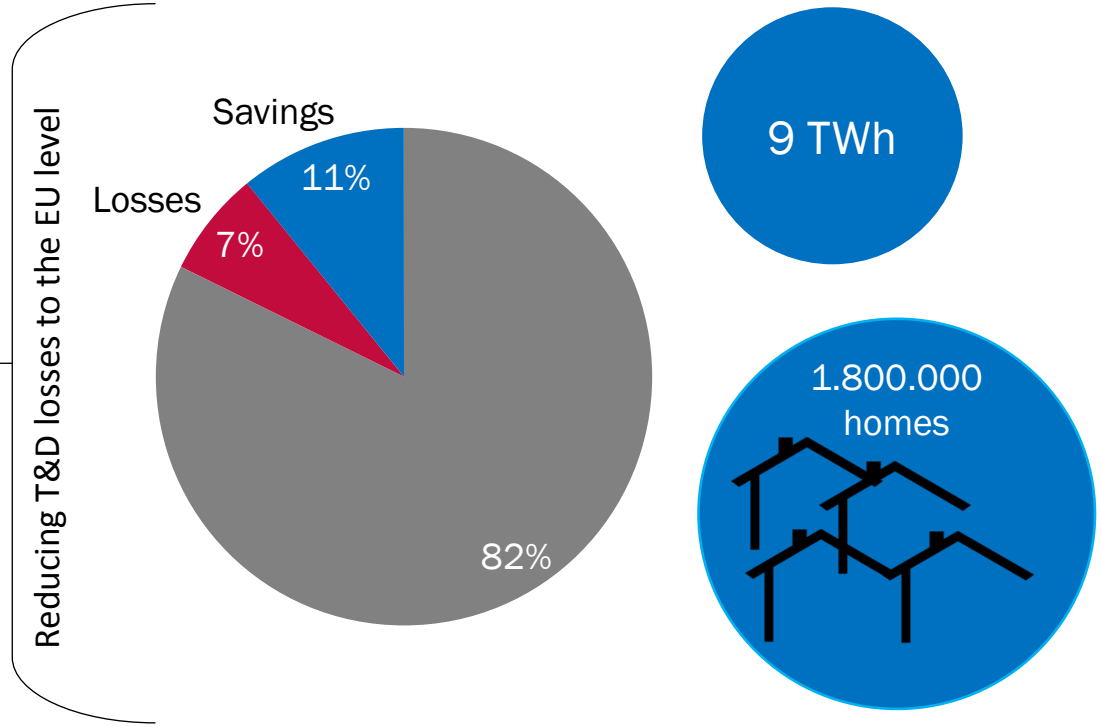
Achieving the level of EU28 T&D losses across the SEE region could save ~9TWh of electricity, enough to power 1.8 million homes





Sources: IEA 2014 data for domestic electricity supply, Energy Community for T&D losses (IEA for the EU and Croatia), http://seechangenetwork.org/sustainable-energy-how-far-has-see-come-in-the-last-five-years-south-east-europe-energy-watchdog-report-2016/

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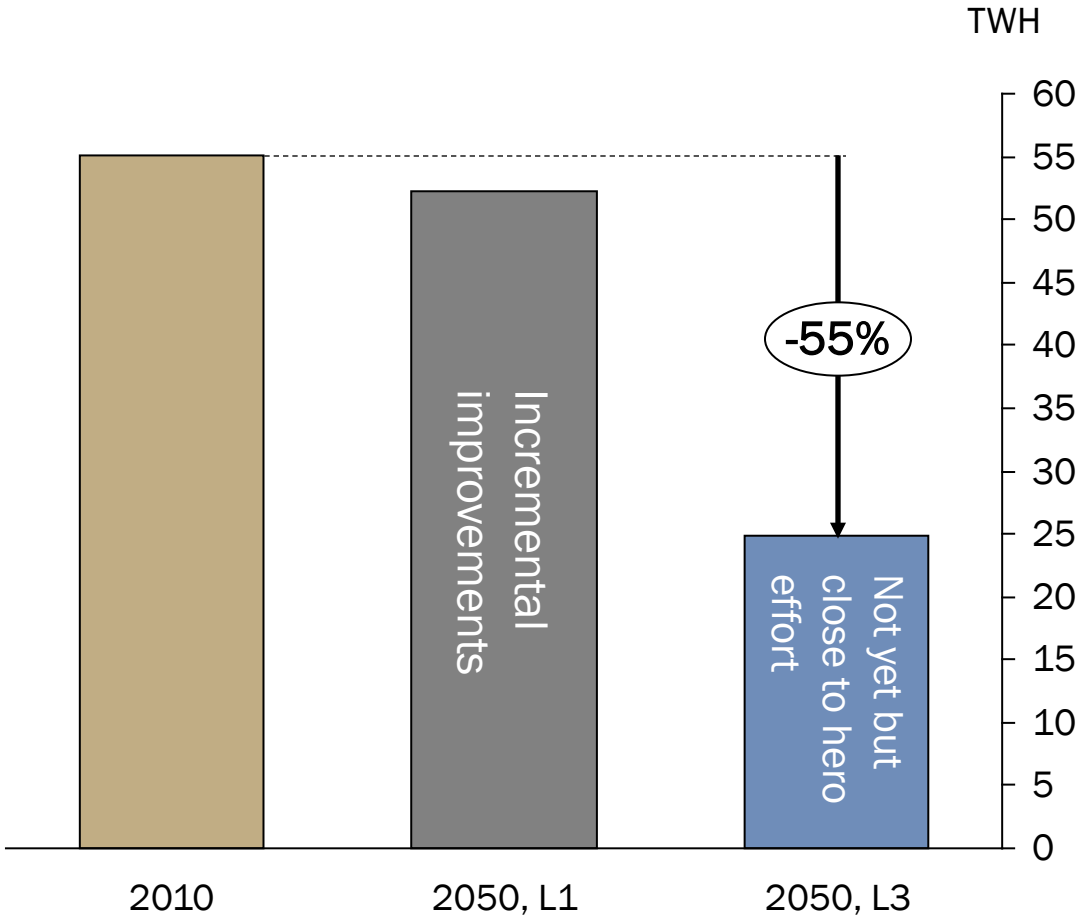
By refurbishing homes, SEE could reduce energy expenditure and lift people out of energy poverty



Energy savings in residential sector following from different level of effort in pace, scope and thermal standards of renovated and new buildings, excluding the impact of heating technology improvements

Sources: SEE 2050 Calculator, https://www.see2050carboncalculator.net/2050/see/Energy.php

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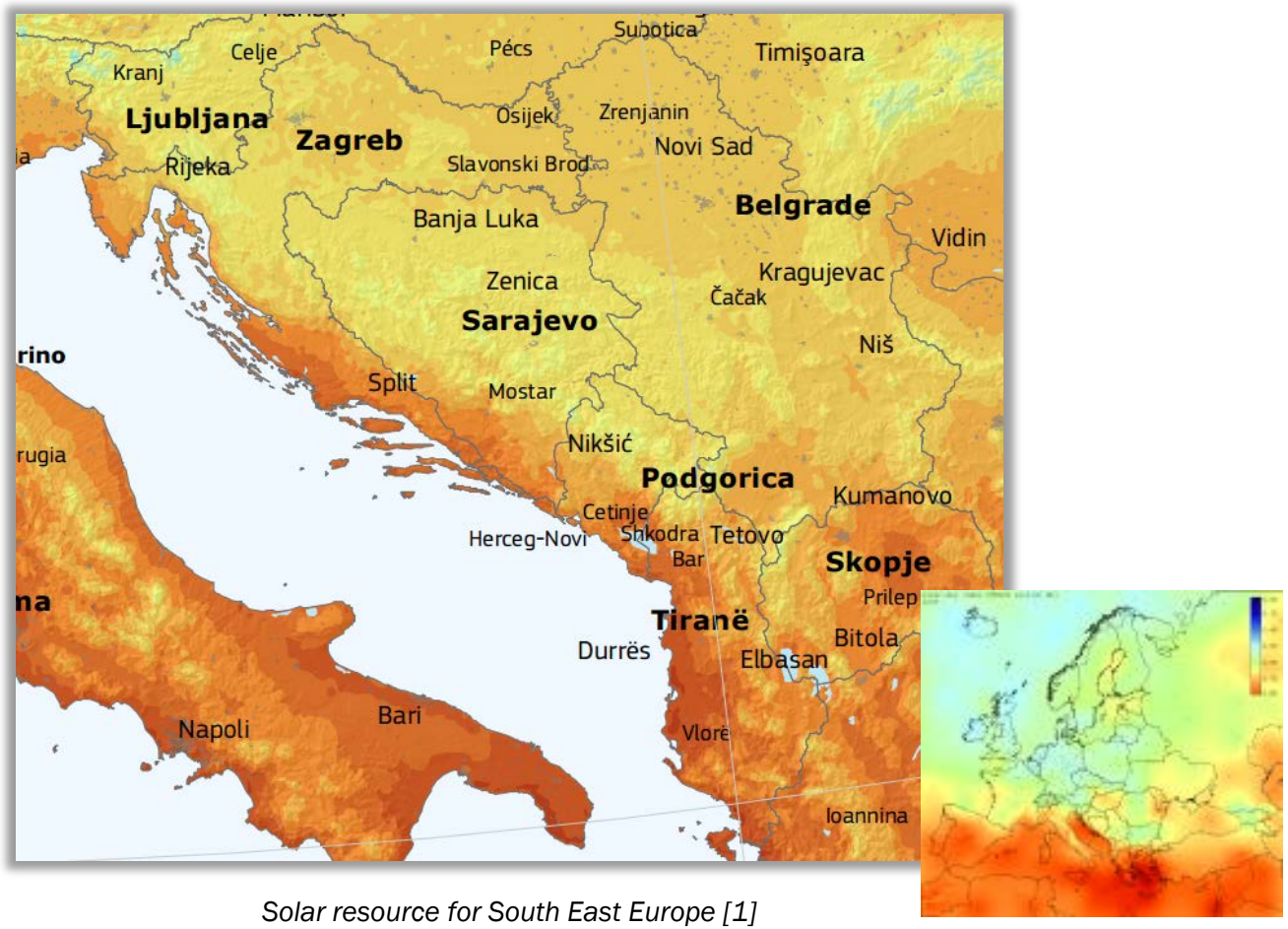
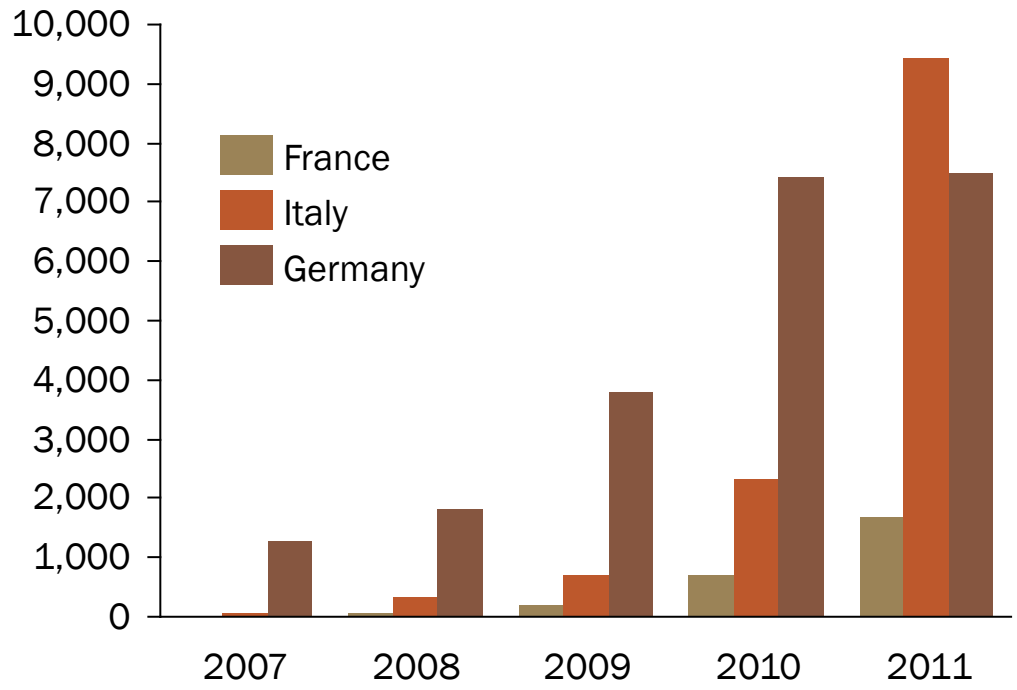
SEE has a strong regional solar resources, less variable throughout the year and more stable than many other European countries but…



Solar resource for South East Europe [1]



European solar PV installations (number) from 2007–2011 [2]

Sources: [1] http://re.jrc.ec.europa.eu/pvgis/cmaps/eur.htm;, [2] Ameli, N., Kammen, D.M. 2014. Innovations in financing that drive cost parity for long-term electricity sustainability: An assessment of Italy, Europe's fastest growing solar PV market.

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Solar PV capacity, based on roof top potentials, by taking either zero or hero effort

Country	L1 20%	L4 Maximum Technical Potential
Albania	0.58 Gw	2.88 Gw
BiH	1.96 Gw	9.79 Gw
Croatia	2.78 Gw	13.91 Gw
Kosovo	0.9 Gw	4.50 Gw
Macedonia	1.06 Gw	5.29 Gw
Montenegro	0.35 Gw	1.73 Gw
Serbia	6.13 Gw	30.67 Gw

First solar power plant in Serbia, 5 kw.
School roof can house 35 kw.

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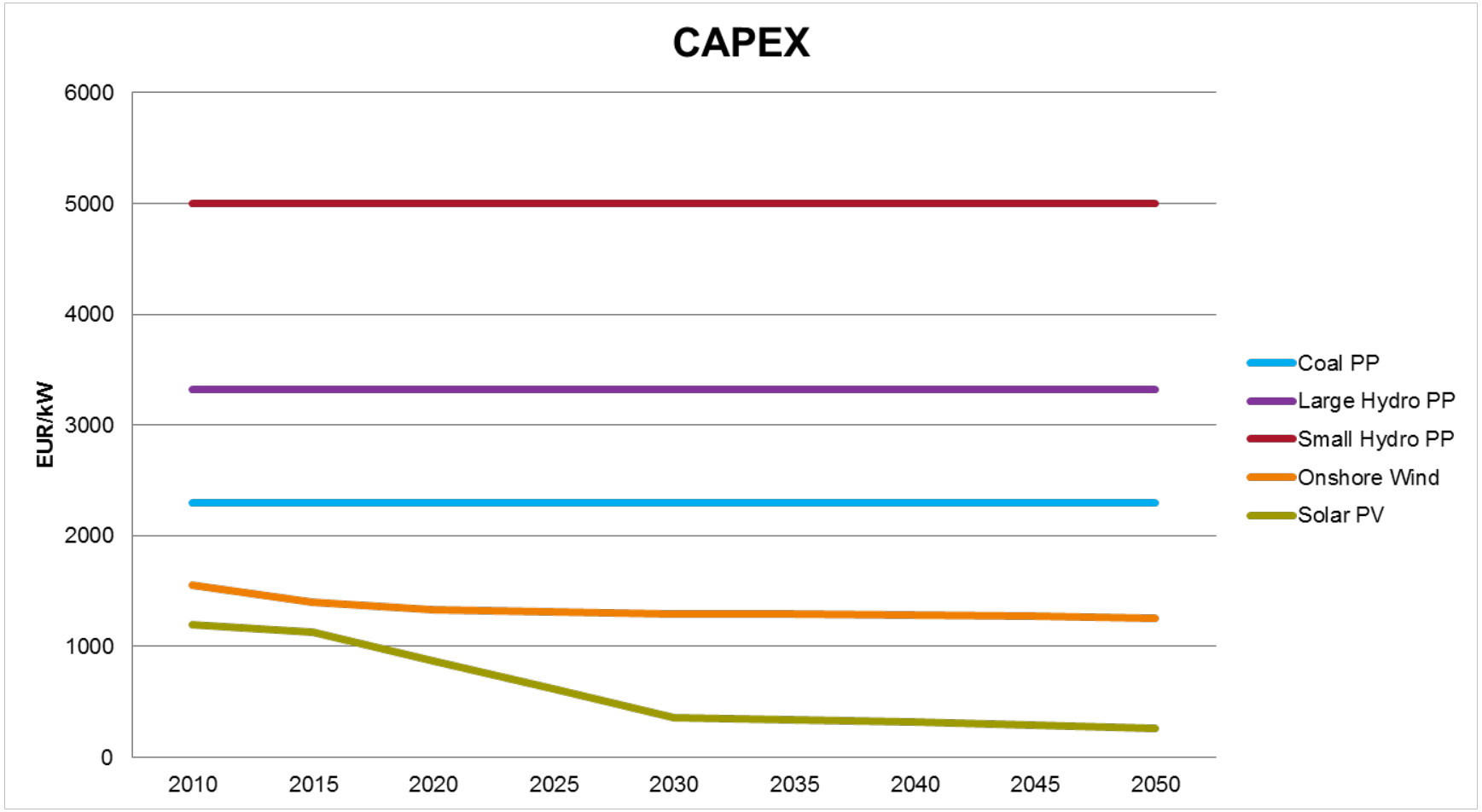
Capital costs of solar PV expected to decrease significantly, while capex of mature technologies, thermal power plants and hydro power plants, remains constant by 2050



Source: Call for Evidence, Report, section on costs produced by Mr. Guy Turner of Trove Research
http://seechangenetwork.org/wp-content/uploads/2015/07/South-East-Europe-2050-Energy-Model-Call-for-Evidence-Report.pdf

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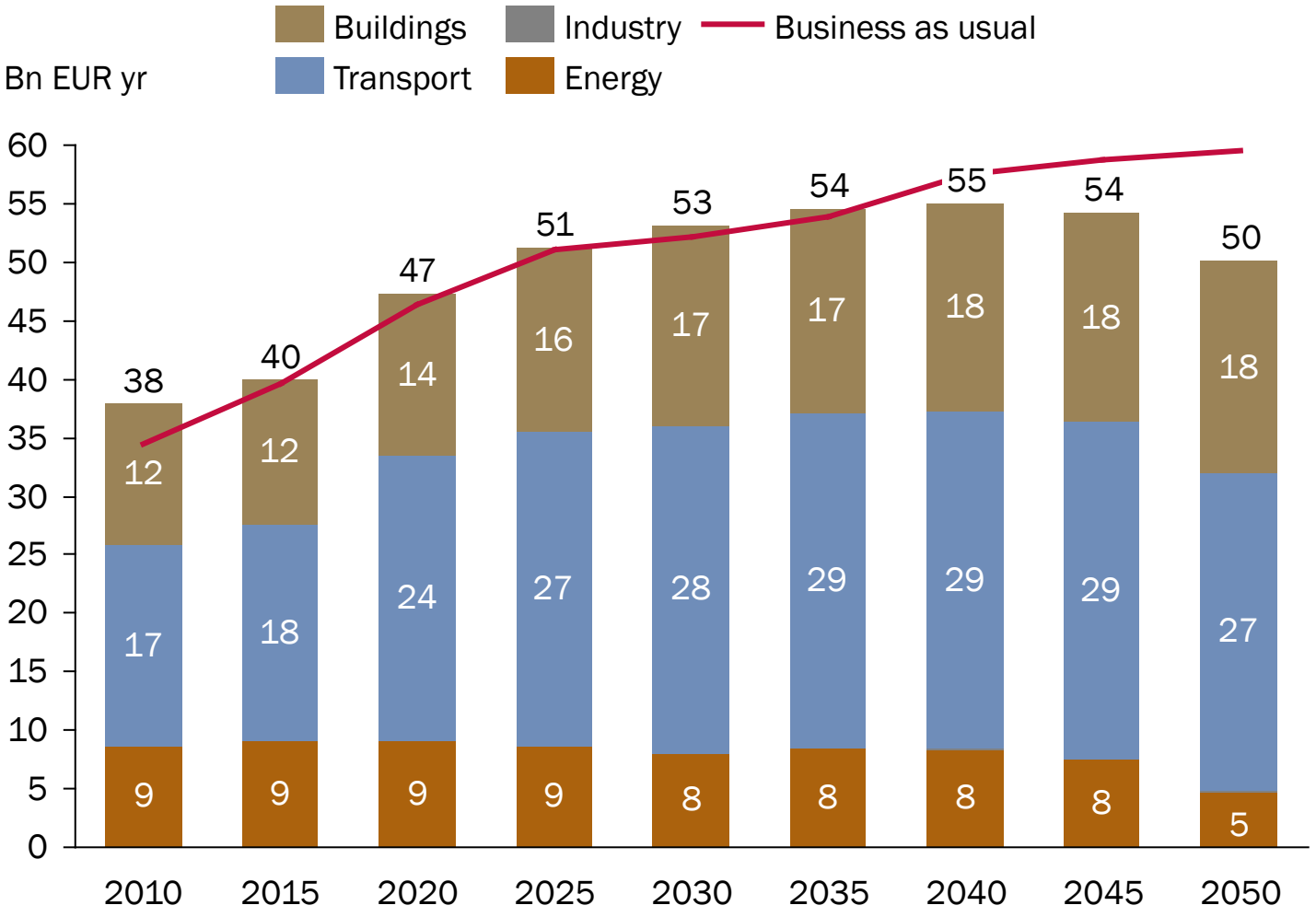
Several low carbon growth pathways can be significantly cheaper than the “business as usual”



- The low carbon path investments are higher and are balanced by energy savings
  - Transport: mode switch and shared vehicles significantly reduce costs
  - Buildings: renovations can be expensive but enable fuel savings
  - Energy: On short term, renewable energy can by more expensive. On long term, renewable energies get similar to less expensive cost.
  - Industry (not shown): fuel savings pay for energy efficiency measures
- The low carbon path meets the EU goal of 80% reduction in GHG emissions from 1990 levels. For instance, the coal-dependent pathway reduces GHG emissions to 75% of 1990 levels,
- This is before considering public health or the environment.

Sources: SEE 2050 Calculator, https://goo.gl/w6Ps42

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There are many more messages, trade-offs and synergies, that can be explored using the SEE 2050 Calculators

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SOUTH EAST EUROPE 2050 ENERGY MODEL

In order to encourage open and transparent sharing of information, the Energy Community Secretariat provides a vehicle for a virtual center for energy modeling.

The South East Europe 2050 Energy Model (SEE model) demonstrates energy pathways for the six Western Balkan Energy Community Contracting Parties and Croatia. It focuses especially on EU energy policy pathways and shows the long-term consequences to 2050 of the decisions and practicies undertaken today. The model was presented to the Energy Community Permanent High Level Group on 17 Dec 2015.

The SEE model was developed by a modelling team consisting of international and regional experts who worked with regional civil society groups as a part of South East Europe Sustainable Energy Policy program. The SEE model used is based on the 2050 Calculator, an energy model developed by UK's Department of Energy and Climate Change (DECC) to engage policy makers and the public in a dialogue on changing energy pathways. 17 countries of the world[1] use the 2050 Calculator model, but this is the first one created for a whole region.

The model offers a range of scenarios, from business-as-usual, using all the coal there is and not investing in renewable energy sources, to an EU-compatible scenario demonstrating that it is technically feasible to have a low-carbon and efficient energy system. The energy model(s) are presented in two forms: as a technical interface and an online video game.

SEE 2050 CARBON CALCULATOR

SEE 2050 Carbon Calculator is a **technical interface** aimed at energy experts and policy makers that enables a detailed analysis of physical and technical energy potentials in ten different supply and demand sectors with 45 different parameters for each of the seven South East Europe countries (Albania, Bosnia and Herzegovina, Croatia, Kosovo*, FYR of Macedonia, Montenegro and Serbia).

ACCESS SEE 2050 CARBON CALCULATOR

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Thank You
Questions on our the 2050 Calculator more than welcome!!!

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Ana Rankovic – ana-fractal@seechangenet.org

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