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SOUTHEASTERN EUROPE

Still Stuck in the Past: How Addressing Energy and Climate Change can Advance Development

Heinrich-Böll-Stiftung

Fostering democracy and upholding human rights, taking action to prevent the destruction of the global ecosystem, advancing equality between women and men, securing peace through conflict prevention in crisis zones, and defending the freedom of individuals against excessive state and economic power – these are the objectives that drive the ideas and actions of the Heinrich Böll Foundation. We maintain close ties to the German Green Party (Alliance 90/The Greens) and as a think tank for green visions and projects, we are part of an international network encompassing well over 100 partner projects in approximately 60 countries.

The Heinrich Böll Foundation works independently and nurtures a spirit of intellectual openness. We maintain a worldwide network with currently 30 international offices. Our work in Serbia, Montenegro and Kosovo concentrates on the democratisation process, political education, and environmental protection and sustainable development. We support and open public fora about topical and marginalised socio-political issues and we enable networking among local and international actors whose work aligns with Green values.

Cover photo Smog of Belgrade, photo: Marija Janković

Introduction: Still Stuck in the Past

Energy and Climate Change in South East Europe

By Damjan Rehm Bogunović

In 2004 UNDP published a report entitled *Stuck in the Past - Energy, Environment and Poverty in Serbia and Montenegro*. The study demonstrated how Serbia and Montenegro were still 'stuck in the past' in terms of their ability to manage energy needs in a way that will serve their developmental needs. Their economies were based on low-energy efficiency, high-energy intensity, high external, namely environmental and health-related, costs of energy generation and were out of tune with the time, generating poverty and hindering economic development. These findings were and still are very applicable to the entire South East European region. Now, more than a decade later, there are still no public policies in sight which would address these issues in the long run.

In the meantime, countries in the region became parties to the Energy Community, parties to the Paris Agreement and also became EU potential candidate or candidate countries. All of this implies a significant formal dedication to climate change mitigation, reforming of energy systems, and decarbonising economies, in line with ambitious EU targets. Formal political commitment, however, does not translate into tangible action and Nationally Determined Contributions to the UNFCCC testify to that. States seem to still think of themselves as 'developing' countries, whereas they should be thinking of themselves as future EU members.

Discussions on 'GDP fairness' as a mitigation criterion do not seem to take into account the huge carbon and overall energy intensity of economies in the region: to produce one unit of GDP in the Western Balkans, takes *several times* more energy and CO2 than for an average EU country. In fact, the carbon and energy intensity of Serbia or Bosnia and Herzegovina are similar to that of China! GDP growth rates, however, are not to be compared. This has to change. Furthermore, according to the Health and Environment Alliance (HEAL) in all of Europe, the South East European region has the highest health-related costs per capita due to air pollution from coal-fired power plants. This also has to change.

Energy is a major business everywhere and corporate interests have been widely discussed especially related to the fossil fuels. However, in the post-socialist region of South East Europe, the energy business is mostly state run so the usual simplified dichotomy of private capital interest vs. public good seemingly does not stand. Fossil fuels-based energy is produced, distributed and charged almost entirely by public enterprises and should serve the public interest. However, this is not the case. By openly or indirectly supporting fossil fuels, public authorities and publicly owned companies reproduce the economic status quo. If we take into account the state of democracy in the region, whose political systems are commonly described as 'kidnapped' or 'captured' states, 'abducted' by political (party) elites and their private interests, then the 'public' in public enterprises and their privatisation, public interest, public institutions, public funding and resources or public consultations ought to be rethought.

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This issue of Perspectives is dedicated to climate change mitigation in the Western Balkans, because of both the global need to limit global warming but also because mitigating climate change, as the articles show, goes *hand in hand* with development both in terms of economic growth and in terms of health, wellbeing and societal development. With this context in mind, the articles before you shed light upon some of the commonly overlooked aspects of it but also point to solutions which are good starting points for any future changes in how we think of energy, development, and public good more broadly.

[1] With the exception of Kosovo which is not a member state of the United Nations.
[2] Data according to International Energy Agency (IEA).

Photo: courtesy of the Forum for Ethnic Relations.

I CHALLENGES

Energy Union & Paris Agreement: last nail in the coffin of coal in South east Europe?

By Dragana Mileusnić, Igor Kalaba

When the European Commission launched the EU Energy Union Strategy[1] in 2015, it set out a vision for reshaping the European Union's energy system and a move away from a fossil fuel-based economy. The Energy Union Roadmap foresaw that significant attention would be paid to Southeast Europe and to further strengthening the external dimension of EU energy policy. What has the Energy Union brought to the EU and Southeast Europe three years later?

First things first: Inception of the Energy Union idea

When the most recent crisis over gas emerged between Russia and Ukraine in early 2014, the EU took up its usual role as mediator between its neighbours. In this case, however, the stakes for Europe were higher, as the EU depends on Russian gas that is transported through Ukraine for about a third[2] of its gas imports. Accordingly, European leaders decided to take this opportunity to push for long anticipated and much needed deep reform of EU-wide energy policy.

The process began with a proposal by the former Prime Minister of Poland and current European Council President Donald Tusk. He launched the idea of an *energy union* in April 2014, calling for Europe to improve its energy security, primarily by negotiating joint gas agreements with Russia and increasing the use of domestic energy sources. Despite the initial resistance of some in the EU policy arena to these ideas, the Energy Union emerged a few months later, when the President of the European Commission, Jean-Claude Juncker, declared it a strategic priority for his mandate.

In the following months, Brussels was gripped by suspense: Anyone with an interest in energy wondered what the Energy Union would entail. Certainty was scarce, and speculation widespread. Finally, the Energy Union strategy and its accompanying action plan were launched in February 2015.

Actions speak louder than words

The Energy Union Strategy set out an ambitious vision for Europe: It declared the EU's determination to decarbonize by 2050 and enable the transition to a low carbon economy by ending support to fossil fuels, including coal. This vision, for a Union whose most influential members still heavily rely on coal (such as Poland, Germany and the United Kingdom), seemed a bold plan.

A closer look at the Strategy and the planned actions showed a strong gas agenda in the short term. The Southern gas corridor[3] appeared to be the flagship project of the European Commission at the time, together with higher utilization of liquid natural gas (LNG) and expanded cooperation with other potential gas suppliers. Furthermore, the capacity markets[4] that are currently under discussion, could extend the lifespan of European coal facilities beyond the period that was initially planned, and benefit along the way. By pursuing such measures, the EU risks locking itself into carbon intensive infrastructure that will push the achievement of the 2050 decarbonisation goal beyond the its reach.

Paris Agreement turning the tide

In early 2015, the Energy Union seemed to be a nice vision that lacked action to

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underpin it. However, the Paris Agreement, agreed in December 2015, set out a more ambitious policy framework for the European Commission to deliver on. The EC was tasked with proposing legislation that would enable the implementation of the Paris Agreement and the Energy Union vision. This was achieved through the *Clean Energy for All Europeans* (CE4All) policy package, tabled in November 2016. The CE4All policy package defined the ways in which the 2030 Climate & Energy Framework will be implemented, redefining the rules of the electricity market so as to enable higher uptake of renewables, recasting the Renewable Energy Directive and revising the Energy Efficiency Directive. A particular novelty was the proposal for Energy Union Governance, requiring Member States to develop integrated National Energy and Climate Plans. These plans must address all five dimensions of the Energy Union and describe each country's contribution towards joint EU climate and energy goals.

At the time of writing this article, the CE4All package is subject to trilogue negotiations between the European Parliament, European Commission and the European Council. Despite numerous deficiencies, the process is nonetheless driving the EU a step closer to decarbonisation.

Climate action spilling over into Southeast Europe

Following the adoption of CE4All in the EU, the next step in Southeast Europe is clear: CE4All should be fully transposed and implemented via the Energy Community Treaty. Following the adoption of the Paris Agreement, an inter-Ministerial Climate Action Group[5] was established in June 2016. The group meets several times per year to discuss pathways towards decarbonisation in the region. The Action Group includes a small number of civil society representatives, which is a precedent, even in the EU.

This January (2018), Energy Community Treaty countries adopted a Recommendation to prepare for the development of integrated National Energy and Climate Plans[6], following the provisions of the Energy Union Governance Regulation.

Energy Community Treaty countries are also discussing 2030 targets for greenhouse gases emissions reduction, renewable energy and energy efficiency. The process might link up to the Talanoa dialogue, under the Paris Agreement. This would be an excellent step forward in terms of regional cooperation and trust building, which is an essential ingredient for an energy system fully powered by renewables. However, for that to happen, 2030 targets must be ambitious enough to lead to an actual reduction in emissions, unlike current nationally determined contributions. For this to happen, methodology issues need to be resolved in a way that would prevent loopholes that could be used to justify low ambition.

Energy Community Treaty still needs teeth

The Energy Union initiative has already strengthened the Energy Community Treaty[7]. The countries of Southeast Europe have been party to the Energy Community Treaty since 2006. The Treaty brings EU energy legislation to the Western Balkans, Moldova, Georgia and Ukraine. It should ultimately lead to an integrated energy market between the EU and the Energy Community countries.

However, the current framework has failed to fully deliver on its potential, due to weak enforcement mechanisms. To address this shortcoming, a reform process was launched in late 2013. The proposed options for improving enforcement include establishing a Court of Justice or a Regional Investment Court, which would bring much needed independence to the Energy Community. A number of other potential sanctions have also been under consideration, such as the possibility of conditioning the disbursement of EU development assistance on compliance with the Energy Community obligations. The reforms should ensure the effective implementation of the EU's energy, environment and competition *acquis* and energy market reforms by incentivising investment in clean energy, as is the case in the EU. The reform of the Energy Community Treaty has not yet been concluded and awaits decisive action by the European Commission.

Reality check for coal industry in Europe

Although there has been a belief that coal is undergoing a renaissance in Europe, data[8] shows otherwise. The overall trend demonstrates that the use of coal in Europe

is declining, while both European institutions as well as Member States are beginning to address the problem structurally. European countries are increasingly committing to phasing out coal. Together with their partners from Canada and across the globe, some European countries have joined forces through the Power Past Coal coalition.

With the economic case for coal diminishing, the private sector is now leading the way. E.On, the largest German utility company, has decided to move out of the fossil fuel business and focus its main operations on renewable energy. Markets in Europe have made this change inevitable, as major utilities that are still investing in coal have begun to make serious losses[9]. In addition, the divestment[10] movement has caused many organisations and universities to stop investing their money in dirty energy.

Prospects for a coal phase out in Southeast Europe

As the Energy Community Treaty reforms, new coal plants are becoming increasingly expensive to build in Southeast Europe, too. There are also indications that a regional Emissions Trading Scheme might be created. Even if it is not, the region will still have to pay once it joins the EU, where the price of carbon is again on the rise, with the goal of a minimum of EUR 30/tonne CO_2. Complying with these requirements means higher costs for coal power plant construction and is pushing investors towards renewable energy. It also results in numerous benefits for citizens. Data shows that every euro invested in reaching EU environmental standards brings €17 in environmental and health benefits.

Regardless of the Energy Community Treaty, all the countries of the region that aspire to become fully-fledged EU members must align with EU standards, so addressing environmental issues is inevitable over the time. Local resistance to coal is growing stronger in the Balkans as well, as a referendum[11] on the construction of new coal project, Plomin C, in Croatia has showed. 94% of respondents said no to the project. A harsh lesson on new coal also came from Slovenia, where the coal plant Sostanj 6[12] came to represent an iconic example of poorly planned investment, with costs doubling over time. An analysis by campaigners in Bosnia and Herzegovina has shown that the TPP Gacko II[13] coal plant, if built, will meet the same fate as Sostanj 6. Scores of other analyses by local and international organisations have repeatedly shown the full extent of the negative environmental, health and economic impact that new coal plants will have on the people of the European continent, not only in the region itself.

Taking into account the overall trends and the vast potential for energy efficiency and renewables in Europe and in the region, in the long term we should expect to see a 100% renewables-based society. In order to realise this change, gas is likely to play a very limited role for an intermediate period, in order to enable an easier transition to the low-carbon economy. All plans for new coal thermal power plants must be dropped and the most polluting coal plants decommissioned as a matter of urgency, while others need to be phased out over the next few decades. The evidence shows that Europe is on this path. Southeast Europe is heavily influenced by developments in the EU and will undisputedly follow its lead: Therefore, it is now clear that coal does not have a bright future in the Balkans.

1 http://ec.europa.eu/priorities/energy-union/docs/energyunion_en.pdf
2 http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Main_origin_of_primary_energy_imports,_EU-28,_2002%E2%80%9312_(%25_of_extra_EU-28_imports)_YB14.png
3 http://www.tap-ag.com/the-pipeline/the-big-picture/southern-gas-corridor
4 Capacity market is a scheme to reward power generators for their potential to produce (installed capacity) electricity, in addition to the electricity they actually produce and sell (http://energytransition.de/2015/01/how-to-reform-eu-power-markets-capacity-market/)
5 https://www.energy-community.org/news/Energy-Community-News/2017/09/05.html
6 https://www.energy-community.org/news/Energy-Community-News/2018/01/10.html
7 https://www.energy-community.org/portal/page/portal/ENC_HOME
8 http://awsassets.panda.org/downloads/dirty_30_report_finale.pdf
9 http://www.windpowermonthly.com/article/1330526/portfolio-shake-up-europes-energy-majors; http://www.wsj.com/articles/SB10001424052702304815004579418311683581796.
10 http://www.theguardian.com/environment/2014/oct/08/fossil-fuel-divestment-a-brief-history
11 http://www.vecernji.hr/hrvatska/istra-na-labinstini-danas-referendum-o-termoelektrani-plomin-c-997614
12 http://www.focus.si/files/programi/energija/2014/mythbuster.pdf
13 https://bankwatch.org/blog/planned-gacko-ii-lignite-plant-in-bosnia-herzegovina-likely-to-make-losses-shows-new-analysis

Energy poverty in Serbia: the vicious circle and the way out

By Aleksandar Macura

Serbian households spend, on average, 12% of their disposable income on energy. According to a conservative but widely accepted definition, this means they fall into the category of the energy poor. These households are faced with some tough decisions: sufficient warmth and good quality indoor environment are too frequently traded for some monetary savings. Less food, less education, less clothes, less travel are bought as a result of energy consumption costs, and, even worse, some portion of food, education and other goods and services is bought at the expense of warmth and healthy air. Public health might be at risk from energy poverty.

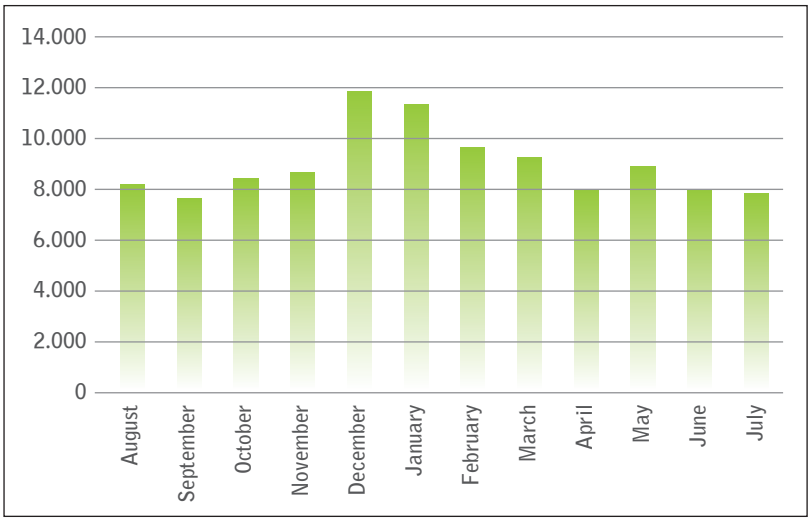

Figure 1 Monthly mortality data in Serbia in the period from August 2016. until July 2017. Source: Statistical Office of Serbia.

Household capital and energy poverty

In Serbia, all forms of household capital (money spent on fuel, knowledge, money spent on heating devices, social capital, ownership of forest) taken together, are usually not enough to procure a sufficient amount of energy (with less than 10% of disposable income), and to maintain a lifestyle that supports household members' health in the long term. This is one of the faces of energy poverty. It is not only the household members themselves who are able to see this face; so are the medical workers, employers, managers of health insurance companies and pension funds. This poverty reflects the lack of household capital. Households are poor if they possess inadequate physical, human or social capital and are not able to secure returns on available capital to meet their basic needs or secure a healthy life.

Energy efficiency matters

Obviously, households with less disposable income are at a greater risk of being

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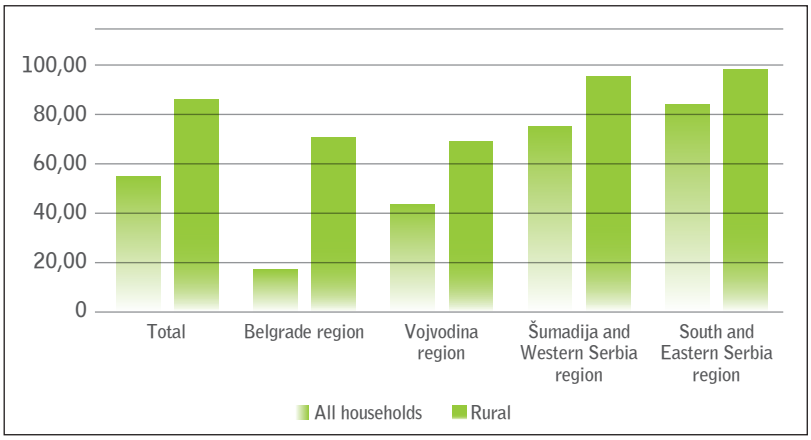

Figure 2 Share of households owning solid fuel stove.
Source: Statistical Office of Serbia

trapped in energy poverty than households with more disposable income. Nevertheless, we may see that some financially better off households may suffer from energy poverty and its health-related consequences, while their neighbours with less financial capital may do better in this respect. This is due to energy efficiency - energy efficiency is, in fact, the solution to the energy poverty problem.

Table 1 Time schedule of annual peaks in electricity network in Serbia and respective prices at Budapest power exchange. Source: EPS; HUPX

Year	Date	Day	Hour	HUPX price €/MWh
2012	08 February	Wednesday	19	171.5
2011	02 February	Wednesday	19	67.61
2010	31 December	Friday	18	63.59

Inefficient, technologically outdated stoves used for combined heating and cooking purposes in many Serbian households are at the heart of the energy poverty challenge in Serbia (Figure 2), but also in the region. These stoves represent the form of capital that does not perform well. Warming the house with such a stove may require double the amount of fuel wood when compared to the most modern devices serving similar purposes. Inefficient burning creates indoor as well as outdoor pollution. Outdoor pollution reaches neighbours. Neighbours thus join the club of those who may see, feel, smell and breathe energy poverty.

The race to the bottom

On very cold days, when household stock of fuel wood is depleting, and market prices rise, electric heaters are turned on to provide for additional heat. Electricity, at these times, is the fuel of choice given the fact that its price is the same as in other periods, and that it is only payable in a month's time, if at all. Hundreds of thousands of electric heaters are switched on in a short period of time. Electric wires, power stations and power plants need to respond to this massive demand. They have to be ready to do so**.** Plants that meet this additional demand cannot be deployed in the electricity markets in this period.
Unfortunately, this is exactly the period of highest prices in electricity markets in the region, as seen in Table 1. The electric power utility is losing money. Its most expensive and most lucrative assets, such as reversible power plants[1], serve the least profitable demand: household supplemental heating. Return on capital falls low for the power utility. The power utility and its owners, Republic of Serbia in this particular case, also begin to see the face of energy poverty.
Such households also pay more for less energy and less comfort. By paying more for their energy they are forced to restrict their demand for other goods and services. They buy less food, less clothes and fewer books. They go to local grocery shops less frequently and rarely get their hair cut. Producers and sellers of those goods and services lose income and are unable to maintain and expand their businesses limiting employment opportunities. Without effective demand, existing businesses and prospective start-ups may not develop. Employment opportunities do not arise, overall economic output and associated budgetary revenues stagnate. Energy poverty spreads, reaching every citizen in the country.

Vulnerable customers

Countries across Europe and across the world have worried about the ability of customers to pay for their energy bills (in particular, bills for electricity). Frequently, liberalisation of energy markets was the

driving force behind these concerns. Some countries recognise vulnerable customers as those who spend a higher share of their disposable income on energy in comparison with some agreed threshold, usually 10%. **Let us repeat that it is the total available household capital and its performance that determines whether the household will be poor.** Where energy poverty is concerned, income is frequently not the main driver of energy poverty, although it is always very important. Even when income is the most important driver, marginal benefits of increase of other forms of capital may be much higher with regards to energy poverty. For instance, for a household in energy poverty, buying a new, more efficient stove is a far more efficient remedy to its energy poverty and associated consequences than providing cash subsidies to pay the bills.

It is not network energy that matters where energy poverty in Serbia (and in the Western Balkans as well) is concerned. Fuel wood is the fuel of choice. Households with the lowest purchasing power (the first decile of consumption, Figure 3) almost exclusively use solid fuels for heating. We now know that they use fuel wood and that they use it in inefficient stoves.

The Government of the Republic of Serbia adopted a 'Decree on vulnerable customers' in 2013 (the revised version is in effect since January 2016) placing this important subject on the political agenda. Consumers fulfilling certain criteria are eligible for reduction of their selected network energy bill (electricity, gas or district heating). The government invests public money but does not achieve any change in the structure of household capital. Returns on available assets do not rise. In other words, households do receive support to pay their bills but remain energy poor.

Remember: Efficiency matters

Entering a household and replacing their inefficient and polluting stove with a modern one, that is roughly twice as efficient, would have a different effect. The government may wish to invest more public money in one year (roughly the equivalent of up to five annual cash subsidies to a four-person household) yielding annual returns on investment (household savings) larger than the annual cash subsidy (Table 2).

Table 2 Comparison of annual cash subsidies for vulnerable customers (four-person household) and possible savings from energy efficiency improvements due to stove replacement. Source: Unlocking the Future, Serbia case study, Heinrich Böll Foundation, 2014.

Annual cash subsidy - no energy efficiency improvements (in EUR)	120
Annual savings, stove replacement - energy efficiency improvement (in EUR)	180

In such a manner, household capital performance is changed for the better, and the root cause of energy poverty is altered. This way, a need for social support to certain households may remain, but energy poverty would surely be expelled through the chimneys of numerous households while polluting particles would no longer be spread throughout these same chimneys and within the very households.

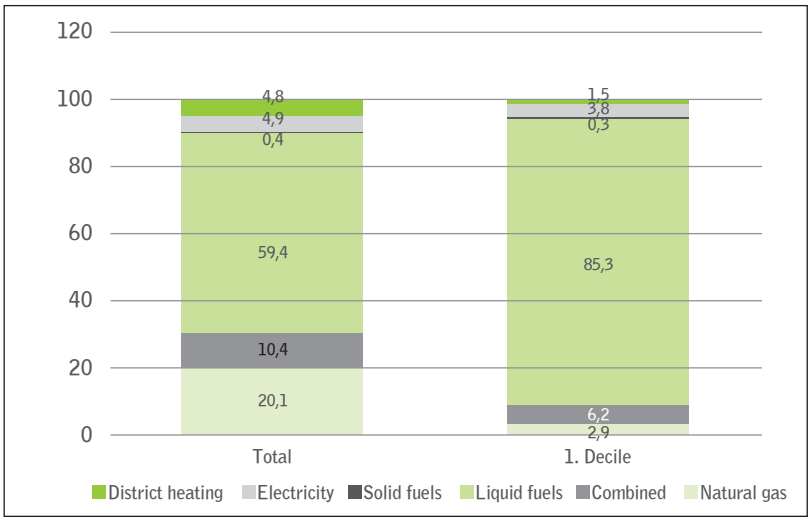

Figure 3 Structure of households according to heating type in Serbia in 2016, for the total population and for the decile with the lowest overall purchasing power. Source: Statistical Office of Serbia

According to a recent study sponsored by the Heinrich Böll Foundation, '*Energija na drugi način*', repeating the same intervention in 200,000 of the poorest households would require EUR 100,000,000 of financing but may lead to annual savings of around EUR 36,000,000, not taking into account health, environmental and other co-benefits.[2] Such an intervention may release more than 600,000 cubic metres of wood for different uses. The efficiency improvement would also facilitate a significant reduction in peak demands in electricity networks. More detailed analysis is required to quantify this positive effect of stove replacements.

The way forward

While the use of public funds may be justified to support the poorest households escaping energy poverty, enforcement of standards for stoves should make other households switch to more efficient devices. Thus, they would assume responsibility for the externalities they create, reducing them at the same time. The domestic industry should be supported, if needed, to match the increased demand for more efficient stoves. Standard enforcement and certification schemes may be built on existing experiences such as those in the United States[3] and United Kingdom[4].

1 Plants that may adjust period of its electricity production to times when prices are highest in the market.

2 A recent WHO report estimated that household air pollution in Serbia caused 9368 premature deaths. The WHO calculated that associated economic loss amounts to USD 28.85 bln. http://www.euro.who.int/__data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf

3 For more details, please visit http://www.epa.gov/burnwise/

4 See for example http://www.hetas.co.uk

Health effects from coal power generation in South East Europe

Vlatka Matković Puljić and Marija Jevtić

Air pollution is the most important environmental risk factor for the health of Europeans. In a recent analysis on the 'Global Burden of Disease' commissioned by the World Health Organization (WHO), air pollution is ranked among the most important risk factors for chronic disease in the European region[1]. More than 80-90% of the urban population in the European Union is exposed to levels of particulate matter and ozone higher than those recommended by the WHO. Coal power generation adds to already poor air quality in Europe and in Balkan countries - caused mainly by the transport sector, industrial processes, residential heating, and agriculture.

Coal power plants release substantial amounts of particulate matter, sulphur dioxide (SO2), and nitrogen oxides (NOx), with the latter contributing indirectly to the formation of ozone. Of these, the most worrying for health are fine particulate matter (PM) and ozone. Other hazardous substances emitted from the smokestacks of coal power plants are heavy metals, such as mercury, and persistent organic pollutants (POPs), such as dioxins and polycyclic aromatic chemicals. These can either be breathed in or taken up indirectly via food and water.

Health damage from coal power plant emissions

Air pollution from coal power plants is contributing to higher rates of respiratory and cardiovascular disease as well as mortality in Europe. It also has impacts on the nervous and cerebrovascular system and affects reproductive capacities and children's health. Air pollutants released from smoke stacks of coal-fired power stations constitute the largest health risk for the general public in comparison to emissions to the water or soil. They cause both acute and chronic health effects. Communities in the proximity of coal power plants sometimes experience much higher exposure to certain airborne pollutants. Most air pollution, however, is transported over long distances and thus impacts a much bigger proportion of the population, by increasing the background levels of ambient air pollution.

The most obvious impacts are on the respiratory system. NOx, SO2, PM and secondary ozone are emitted in coal fumes, and can cause or exacerbate different respiratory conditions. Ozone exposure leads to acute breathing difficulties and exacerbates conditions such as asthma and chronic obstructive pulmonary disease. Longer exposure to certain levels of fine particulates can result in chronic obstructive pulmonary disease (COPD)[2], a group of lung diseases including chronic bronchitis and emphysema, which are characterised by airways becoming narrowed, shortness of breath, and continuing decline of lung function. Fine particulates are even associated with increased mortality rates for lung cancer[3,4]. In addition, diagnosed COPD is also a risk factor for lung cancer mortality[5].

An increasing body of evidence shows clear positive correlation between air pollution and rates of major cardiovascular diseases, as well as cardiovascular mortality. The associations are the strongest for particulate matter. Different studies suggest that cardiovascular mortality rises by 12% to 14% per 10 micrograms increase of fine particulate concentrations[6]. Even short-term

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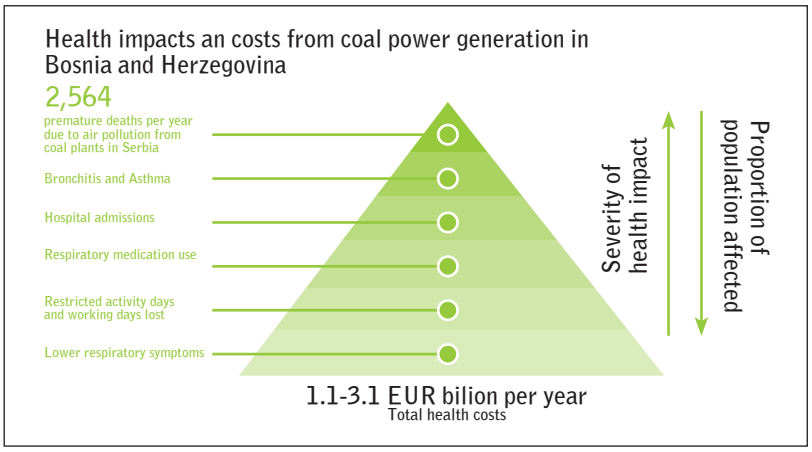

INFOGRAPHICS PER COUNTRY to show health impacts & costs per country

exposure to fine particulate matter can trigger myocardial infarctions, symptoms of ischemic (= coronary) heart disease, stroke and heart arrhythmias, and cause death. Increased hospital admissions due to these conditions have been documented for periods with elevated fine particulates in ambient air[7, 8,9]. Long term PM exposure increases the risk for developing a variety of cardiovascular diseases, including hypertension and atherosclerosis[10].

Increase of cases of lung and bronchus cancer among Serbian population

Annually, 5,200 people fall ill of lung and bronchus cancer, while 4,600 people die of it on average in Serbia. Malignant lung and bronchus tumours are leading malignant sites in illness (21.3%) and in deaths (31.3%) among Serbian men. In the period between 1999 and 2009, an increase of lung cancer illness of 27.4% (with variation from 54.0/100,000 to 42.4/100,000 people) has been recorded in Serbia. This increase is twice as high with women compared to men[11].

Health impacts and attributed costs from coal power generation in some South East European countries

Several countries in South East Europe suffer from particularly bad air quality. For example, Macedonia with 87 µg/m^3 and Montenegro with 53 µg/m^3 mean concentrations of PM10 have some of the worst air quality in the region. HEAL's report 'The Unpaid Health Bill - How coal power plants in Western Balkans make us sick',[12] provided for the assessment of the economic health costs from coal power generation in the five Western Balkan countries. The report is based on the emission from coal plants reported under the Large Combustion Plants Directive (LCPD) and calculated health impacts and related costs.

The burden on health from coal in the Western Balkans is among the highest in the European region. Existing coal power plants create up to EUR 8.5 billion per year in health costs. Currently, five Western Balkan countries are home to 15 existing coal plants with 35 units and an installed capacity of 8.1 GW. These plants are generally operating on low environmental standards generating high levels of polluting emissions and high impacts on health.

New estimates published in 2016 on the unpaid health bill from coal power plants in the Western Balkan countries revealed that those countries host seven of the 10 biggest emitters of sulphur dioxide (SO2) and one of the top 10 emitters of nitrogen oxides (NOx) in the European region. This analysis shows that coal power plants in five Western Balkan countries are producing 7,181 premature deaths per year in Europe, which translates in costs of between EUR 2.9 and EUR 8.5 billion per year in damages to the health of citizens in Europe.

How can the medical community bring about change?

Health and medical experts are becoming increasingly concerned about air pollution and the role of coal combustion in it. Health experts around the world are raising their voice and demanding a halt to the building of new coal-fired power plants. Medical associations leading on coal and health

concerns are The World's Public Health Association, Physicians for Social Responsibility (US-based), Australian Physicians, European Respiratory Society, and from the SEE region: Serbian Medical Experts and Turkish Medical Association, together with Health and Environment Alliance (HEAL). The World's Public Health Association recently advocated for a rapid phase-out of coal and Serbian medical doctors called for recognition of the damaging impacts of coal plants and for a greater emphasis on health in the country's energy strategy.

For health professionals in Serbia, air quality is an issue that they have had in focus for a very long time, but it is becoming more and more relevant in the new circumstances: numerous plans for building coal plants across the country and the need to secure and provide the least harmful sources of energy. Doctors in Serbia highlight the hazardous effects of pollution originating from coal power plants and insist that the national energy strategy must take into consideration the health aspect, both short and long term. Public health experts and medical professionals can play a vital role, especially at the national and local level, in making the phase out of coal a reality. The engagement of public health experts will be crucial to ensure that the unpaid health bill is taken into account in future energy decisions.

A breath of fresh air: what decision makers need to do

From a health perspective, building new coal power plants would work against efforts to tackle chronic disease; it would create substantial costs for public health and lock in hazardous emissions for decades. The external costs to health from coal power generation have been missing from the debate on the future of Europe's energy mix. These costs should be taken into consideration in all future energy investment decisions. Conversely, claims that domestic coal represents a cheap energy source need to be urgently revised.

Given the urgent need to tackle climate change and the substantial health risks related to air pollution, a phase out of coal in power generation is imperative on health grounds, with a moratorium on new coal power plants as a first step. Many South East European countries are seriously struggling to meet air quality standards, and still, many of those countries have new coal projects in the pipeline. Instead, investments in renewable energies and energy savings should be prioritised. They have the potential to secure large health co-benefits, both in the short and long term.

In particular, the national authorities should:

– Develop and implement a national phase-out plan for coal in power generation
– Introduce the highest pollution control standards for existing coal plants
– Include the health sector in energy and climate policy development and regulation
– Consider public health effects in development of the energy and climate strategy
– Introduce a moratorium on the construction of new coal power plants.

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How to play the secret chord: transparency in the energy policy of Western Balkan countries

By Mirko Popović and Zvezdan Kalmar

'Now I've heard there was a secret chord,
That David played and it pleased the Lord,
But you don't really care for music, do you?'
Leonard Cohen, Hallelujah

Introduction

This article examines the issue of transparency in energy policy in the Western Balkans (WB) region with specific emphasis on the harmful effects of hidden political and economic agenda in energy decision making. Bearing in mind the unfavourable state of WB national economies and a constant need for investment in the energy sector, we discuss if there is an inclusive decision-making process on capital investments in place? The article examines the extent to which EU principles of good governance are applied in energy and environmental decision making in WB countries and how this issue influences quality of energy policy performance.

The EU accession process underpins this discussion since it streamlines the democratic transition in the region. Apart from the material conditions[1] in the energy sector, which must be fulfilled, the procedural criteria are examined, such as stability of institutions which guarantee democracy and the rule of law as well as the ability to take on the obligations of membership, including adherence to the aims of political, economic and monetary union, i.e. the Copenhagen criteria for EU membership. In fact, the tension between the proclaimed and adopted principles of democratic governance and the practice of energy decision making is observed.

Energy governance and the principle of transparency

Transparency is a characteristic of governments, companies, organisations and individuals who are open in the clear disclosure of information, rules, plans, processes and actions (definition used by Transparency International). It is based on participation and mutual trust between constituents of public interests. Mutual trust exists when it is based on free access to information. Public policy is not a matter of beliefs, but it is a matter of accountability and citizens' engagement in defining the public interest. No artificial confidence, based on the executive power's belief in the rightness of their operations, shall be in place.

Transparency of energy governance is an essential component of sustainable development. The ultimate policy goal in the energy sector is to achieve environmental, social and resource-efficient energy system that should serve as leverage for generating opportunities for sustainable economic revival in this economically constrained region. Achieving this goal requires public acceptance and constant dialogue between decision makers, energy suppliers and consumers. In the era of a globalised economy and strong pressure on natural resources, the effects of political decisions on energy are producing various influences in different areas such as:

- Economy – energy intensity, the costs of energy services (power and heating), relations between state owned and private energy companies, energy subsidies and capital investments, investment in energy efficiency and renewable energy

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- Environment – negative environmental and health impacts of energy production, external costs of energy production (hidden costs), natural resources exploration and land grabbing, global warming and climate change
- Society – energy projects have strong influence on local communities, social and political conflicts are often part of the energy projects' development; violation of human rights (such as right to respect for private and family life) and energy poverty that affects the region

Many energy projects in the region are at least controversial, in terms of their financial requirements, environmental impacts or the posed risks. Financial arrangements without regular tender procedures, interlinked with weak institutions and increasing corruption justified environmental CSOs' calls for more transparency in energy policy. In addition, security of supply and competitiveness, (in line with EU energy policy goals), should provide benefits for the majority of the population by enabling transformation of common resources into a tradable product.

The baseline: EU energy policy

EU energy governance concerns the organisational structures that are in place to set and realise EU energy policy objectives.[2] The objectives of EU energy policy are to ensure the functioning of the energy market, security of energy supply, to promote energy efficiency and development of new forms of renewable energy and to provide the interconnection of energy networks. It means a competitive, secure and sustainable energy system. Decarbonisation is the key element of this policy, which is to be achieved by shifting the spending away from fossil fuel sources towards low-carbon technologies, and GHG emission reduction up to 95% until 2050.

EU energy transition interacts with different economic and social aspects that can't be neglected. The European Commission also emphasised the value of social dialogue since the transition affects employment and jobs. Energy poverty has to be tackled through 'full implementation of the existing EU energy legislation and innovative energy efficiency solutions.' Due to the expected costs of energy transition it is emphasised that 'pricing schemes need to be transparent and understandable to final consumers. Citizens need to be informed and engaged in the decision-making process, while technological choices need to take account of the local environment'.[3]

A Failed Try: Energy and transparency in the Western Balkans

The energy market of WB region is operating within the scope of the Energy Community (hereafter EnC), based on the Treaty signed between the EU and South East European countries.[4] Signatories are resolved to establish an integrated market in natural gas and electricity, based on common interest and solidarity, and committed to improving the environmental situation in relation to gas and electricity, related energy efficiency and renewable energy sources.[5] The EnC can be defined as a key player that supports reform efforts[6] and a vehicle for integrating the region's energy markets into the common EU market.

The WB region is a fragmented energy market, mainly dependent on fossil fuels. Apart from coal, no significant fossil fuel reserves are being explored.[7] WB economies are highly dependent on imported oil and gas. Import dependency, pollution from out-dated coal energy facilities, high levels of energy consumption for non-tradable purposes and growing levels of energy poverty generates the demand for structural policy change. It is highlighted that such policies 'must be formulated in a transparent way that involves broad public consultation'.[8] Although the International Energy Agency (IEA) key messages refer to the situation in 2008, the practice that currently prevails is not encouraging with regard to transparency and participation in energy decision making. It would be superficial to provide general conclusions on the energy governance of WB countries but there are some common patterns that are illustrative.

The price of electricity in the region is non-cost-reflective. Regulated end user prices do not reflect the real costs of electricity supply.[9] Average household electricity prices in the WB region[10], compared to EU average price (EUR 20.1 per 100 kWh) seem to be quite low and reflect the unbalanced cost sharing among beneficiaries. The average price varies from Serbia (EUR 6.1 per 100 kWh) or Macedonia (EUR 7.8 per 100 kWh) to Montenegro (EUR 10.5 per 100 kWh) and Croatia

(EUR 13.5 per 100 kWh). These figures should be considered in quite a different manner when compared with the external costs of electricity and heat generation. The impact of electricity and heat production on human health and the environment (external costs) were estimated in the 'Study on the Need for Modernization of Large Combustion Plants in the Energy Community'[11]. The average costs of SO_2, NOx and dust emissions (PM) are estimated. The costs are calculated in terms of euro cent per kilowatt hour, i.e. €c/kWh. The average value for the whole EnC is 11.3 €c/kWh, which is considered a very high.[12] The external costs for Serbia are estimated at 10.4 €c/kWh, Croatia 6.7 €c/kWh and for Montenegro at 26.7 €c/kWh. These external costs are still not adequately reflected in energy and heat prices.[13]

According to the Health and Environment Alliance the price of pollution from burning lignite in Serbia is estimated at EUR 4.98 billion annually[14]. It is of particular concern that society is brought to the situation of extortion since it has no other source of electricity than state-owned lignite power plants. There is growing scientific evidence that the price of electricity produced and consumed in Serbia and the WB region is actually much higher than presented and charged to consumers.

The inevitable step towards unlocking the energy future of the region is to implement the principles of good governance in energy policy development. The policy choices must be based on well-timed public participation and disclosure of information. Continuing with un-transparent practice and overwhelming influence of the executive branch of governance will keep the region stuck in energy poverty and environmental degradation. It will also deepen the social conflicts and confrontation with vulnerable local communities. Recent endeavours confirm this. In March 2015, a referendum was held in the Croatian municipality of Labin on construction of the coal power plant Plomin C. Despite the fact that the referendum failed, the majority of participating voters (94%) clearly demonstrated public opinion on the new coal combustion facility by voting against the project.

The Republic of Serbia encountered the consequences of lack of transparency and public consultation in energy infrastructure development. In July 2014, the Serbian Prime Minister announced that: 'Serbia has received perhaps the best conditions of the construction contract for South Stream project'.[15] This happened despite the fact that the European Commission issued the conclusion that none of the intergovernmental agreements between Russia and its South Stream partners is in compliance with EU law.[16] By the end of 2014, the Russian president had declared cancellation of the South Stream gas pipeline construction. Although the South Stream project was announced as the main infrastructural project that would change of the 'B's energy map and Serbia's position on the regional energy market, no serious public discussion was held after the project was cancelled. At the same time, it should be mentioned that South Stream was the flagship political initiative of previous and current leading political parties in Serbia. Benefits of the South Stream project have overshadowed the discussions on the economic loss and benefits related to the sale of Serbia's state-owned oil company NIS (Naftna industrija Srbije) to Russian company Gazprom Njeft. NIS was sold in 2008 without tender procedures, but through direct negotiations with Gazprom Njeft, which were based on an energy agreement between Russia and Serbia. In 2014, the Serbian minister of interior formed a special investigative team tasked with examining the facts and circumstances around the privatisation of NIS. However, the public were never informed of the outcomes of the investigation. According to the police report, the State Prosecutors' Office decided that there was no criminal offence in this case and declared it outside of the jurisdiction of the State Prosecutors' Office.

The same scenario, but with different political consequences was seen in relation to the sale of shares of the Croatian state oil company INA to MOL oil company. The Croatian Government sold 25%+1 shares of INA to MOL oil company in 2003 and 22% of shares in 2008. The INA political affair in Croatia ended with ex-prime minister, Ivo Sanader, being arrested, tried and found guilty of corruption.

Conclusion

The rule of law, as essential political criteria for EU accession, at least provides equal treatment for all actors in the energy market – investors, energy service providers, consumers, etc. Practical application of the rule of law principle is inconceivable

without disclosure of information on energy prices, environmental and health impacts of energy production and consumption as well as transparent decision making on capital investment. Interference from political actors and influential business players on the energy market in the Western Balkans, almost as a rule, results in devastating consequences for regional economies and the public interest. It is therefore true to say that a secret chord being played on the WB energy market over the last two decades has strongly diminished efforts towards sustainable energy transition undertaken through the EU accession process.

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Photo: Damjan Rehm Bogunović

II POTENTIALS

Western Balkans' potential for production of energy from agricultural biomass

By Marijan Gajšak, Darko Znaor and Seth Landau

This article discusses agricultural biomass for energy use in the Western Balkan countries (Bosnia and Herzegovina (B&H); Croatia; Montenegro; Serbia). It provides an overview of biomass production and conversion into energy, and discusses its benefits and limitations.

Biomass is the most exploited renewable energy (RE) source in the world. Through photosynthesis plants convert solar energy into chemical energy which is contained in the biomass. Biomass is considered to be renewable and non-exhaustive[1]. The agricultural sector in this respect is particularly interesting as it produces biomass comprising both crop (plant residues, energy and oil crops) and livestock (mainly manure) products. Unlike forestry, agricultural biomass has a short life-span in terms of production and its production can be planned, adjusted, and improved more quickly.

Elementary conversion of biomass to energy

There are essentially two main ways of obtaining energy from biomass. The first one is biochemical conversion: conversion to fuels, such as bioethanol, biodiesel or biogas. The second is thermochemical conversion such as combustion. The energy in biomass can be utilised as a liquid fuel (e.g. biodiesel), a solid fuel (e.g. burning corn husks), a gaseous fuel (e.g. bio-methane), or transformed into electricity through the burning of fuel to create heat which powers electricity producing turbines.

Biomass can also be processed to biodiesel made from oil from agricultural crops (e.g. rapeseed oil), or from waste oil (e.g. waste streams from food processing). Furthermore, it can be processed into bioethanol where sugars are converted to ethanol or processed into biogas via decomposition – practically becoming methane.

Biomass is most commonly used in households for heating, cooking, etc., or in industry as a heat source. It can also be combusted to produce electricity. In 2010 the global installed capacity of biomass power generation plants was 54–62 GW, representing 1.2% of total power generation capacity providing 1.4% to 1.5% of global electricity production.

Energy production from agricultural biomass in the Western Balkans

The ecological conditions of the Western Balkans, notably its diverse climate, relief, soils and vegetation cover, enable production of a range of livestock types and crops, many of which are suitable for biomass production. In spite of this, at present, energy production from biomass in the region is almost entirely based on forest products. The exception is emerging biogas production. Croatia has 26 operational plants[2], and Serbia has 5[3], all having capacity of approximately 1 MW_{el}. The potential for agricultural biomass production is especially good in the Pannonian region featuring deep, fertile soils. This region produces mainly cereals and oil crops, resulting in considerable post-harvest plant residues and food processing residues. It is also very suitable for production of energy crops and/or fast-growing forest species suitable for biomass production. The latter could be planted on marginal agricultural land, most of which is abandoned anyhow, to avoid competition for land with crops used for human consumption.

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Potential for production of biomass in the Western Balkans

The region utilises eight million hectares (ha) of agricultural land, while nearly another million ha is unutilised (abandoned)[4], representing a massive theoretical potential for biomass production or other land uses[5], without putting pressure on food production areas. **Serbia alone could annually produce a biomass of 1.7 Mtoe[6] – which is almost equal to Croatia's entire annual natural gas consumption[7], while B&H could produce 0.31 Mtoe.** Wheat and corn are the two most produced crops in the region and thus have the most immediate potential for biomass production from residues. Croatia could produce 0.17 Mtoe just from the residues of wheat straw and 0.20 Mtoe from corn stovers[8]. In addition to utilisation of agricultural residues, Perakis et al. (2010) have estimated that the region could potentially generate 157 MW from installed biogas power plants (operating at 8,000 hours per year this would result in 0.11 Mtoe of energy per year[9]).

The role of biomass in meeting EU obligations and GHG reductions

Implementation and utilisation of RE is one of the fundamental goals of the EU. It is crucial for reducing GHG emissions as well as ensuring energy independence of the Member States. As Contracting Parties to the Energy Community (or an EU member in Croatia's case), all countries of the region have committed to implementing the EU's *acquis communautaire* – including commitment to a certain percentage of energy consumed coming from RE sources. All Western Balkans countries consider biomass a strategic resource in meeting these commitments.

Environmental benefits of agricultural biomass

Biomass can be a GHG neutral source: emitting close to the amount of CO_2 that is absorbed from the atmosphere during photosynthesis. If the stock of CO_2 increase is the same as the amount emitted in the utilisation of biomass for energy, it can be considered approximately CO_2 neutral.

Using biomass for energy can reduce fossil fuel use and therefore contribute to a reduction of net GHG emissions. The use of plant residues and livestock manure for energy can also decrease GHG emissions by limiting their decomposition and release of GHG to the atmosphere. Combustion of biomass or its products does not emit significant amounts of sulphur and thus does not contribute to air acidification[10]. Additionally, usage of biofuels in agricultural machinery can reduce soil and air pollution because biodiesel and bioethanol do not contain harmful pollutants (notably heavy metals)[11].

It is also worth noting that agriculture in the Western Balkans, notably in the Pannonian region is highly dependent on mineral fertilisers. Fertiliser manufacturing is an energy intensive process requiring substantial quantities of natural gas[12]. This process causes air pollution and contributes to climate change as does the use of fertilisers. In contrast, biogas production is rather environmentally friendly and its by-product is high-quality environmentally friendly fertiliser and soil conditioner which can be returned to the land and used instead of mineral fertilisers.

Socio-economic benefits of agricultural biomass

The economics of biomass energy production are critically dependent upon the availability of a secure, long-term supply of an appropriate feedstock at a competitive cost[13]. The economic potential of biomass from agriculture depends most importantly on the price for the final energy produced versus the off-taker price. That price depends on availability of feedstock, heating values, moisture content, transport prices, cost of pre-treatment, etc. Biomass itself is generally very cheap. The price of livestock manure can even be zero or negative (i.e. if farmers are willing to pay for its disposal). However, availability and transport costs of agricultural biomass vary greatly. In the USA for instance, its price varies from $1.73 to $4.33 per GJ[14]. Forest and wood production residues are currently more favoured over agricultural biomass in the region. Due to the number of variables involved, it is impossible to recommend a particular feedstock/technology for the entire region.

Biomass production can assist in developing the local and regional economy by

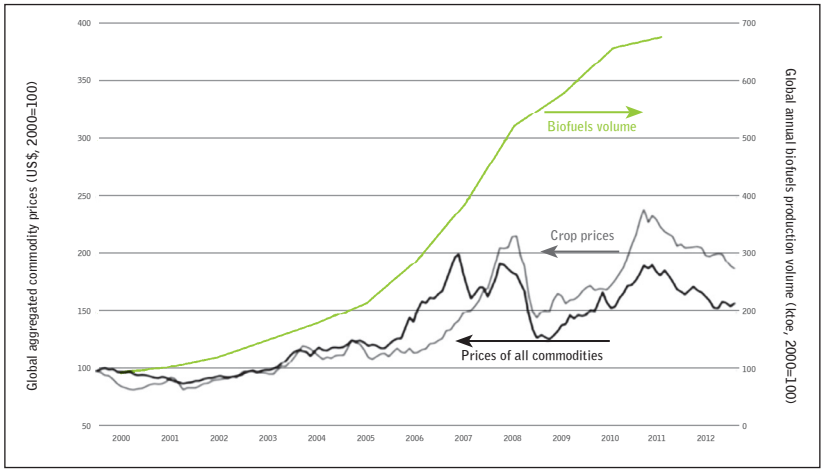

Figure 4: Global crop commodity prices and the aggregated price of all commodities, versus global biofuels production volume, both normalised. Source: Ecofys21

improving revenues and creating jobs. Electricity production from biomass requires ~4 jobs per MW for operating a facility[15] and an additional 10–20 jobs for agricultural production if energy crops are utilised[16]. The UK projects that more than 40,000 jobs will be available in the biomass sector by 2020[17]. These jobs comprise feedstock supply, operation and maintenance, construction and installation, and development. It is likely that the Western Balkans has similar potential.

Negative aspects of energy production from agricultural biomass

Burning biomass improperly in order to generate heat or electricity can emit carbon monoxide, nitrogen oxide, and fine particulate matter, resulting in air pollution[18]. However, this can be greatly reduced using advanced technologies ensuring complete combustion and removal of pollutants. Biogas production can also result in explosions, diseases, and water pollution if operational safety mechanisms are not implemented effectively[19].

Agricultural biomass production requires land. Thus it may potentially compete with food production (or forests), especially if the 1st generation biofuels or other energy crops occupying arable land are utilised. The 1st generation biofuels are produced from crops, which could otherwise be used for human consumption. This raises a range of ethical questions, notably those on the impact on food prices and overall food security. Using arable land for biomass can potentially result in increased prices of other crops and therefore increased food prices (See Figure 4)[20].

Biofuels of 2nd and 3rd generation as a solution?

The 1st generation biofuels are currently the primary substitute for fossil fuels. The 2nd generation biofuels use more complex technologies and processes to produce biofuel – using crop residues or energy crops (e.g. from cellulose). Environmental balances for the 2nd generation biofuels are significantly better than for the 1st generation biofuels in terms of GHG emissions and other environmental impacts. However, their production costs are higher[22]. To ensure successful deployment of second-generation biofuel technologies requires intensive research and development efforts in the coming years. Agricultural and forestry residues should be the feedstock of choice initially, since they are readily available and do not require additional land[23].

The 3rd generation biofuels are produced from algae (mostly microalgae). Algae are the biggest producer of oils (biodiesel feedstock) on the planet, but this technology is not currently commercially exploited. The use of algae as a feedstock does not result in competition with agricultural land as they are produced in aquatic ecosystems. This type of fuel is considered by many as a future source of fuels, but it is still in an early stage of development.

Benefits for agriculture and the environment from biomass production

To conclude, in spite of certain obstacles preventing a wider uptake and utilisation of agricultural biomass for energy production (most of which relate to ensuring a sustainable CO_2 flow and reducing

competition for land resources), there are also numerous socio-economic and environmental advantages of employing agricultural biomass for energy production. As far as the Western Balkans region is concerned, it seems that the region has sufficient areas to produce agricultural biomass on marginal/abandoned agricultural land without compromising or jeopardising food security. If crop residues are combined with livestock manure, the region can achieve robust agricultural biomass production, which would be a significant contributor to true sustainable development of the region.

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Green Power to the People – Croatian Perspective on Community Energy

By Melani Furlan, Robert Pašičko and Mislav Kirac

Despite a long tradition of cooperatives in Croatia, the first renewable energy cooperative (REScoop) was established on the Island of Krk only five years ago. Implementation of renewable energy projects in Croatia often faces various administrative barriers – this is why the island's local community (citizens, local authorities, NGOs, small businesses and public utility services company) came up with the idea of forming a cooperative. The Island of Krk Cooperative has been working on achieving their mission of making Krk the first Croatian eco-island since 2013. The cooperative approach resulted in lower costs for equipment and for obtaining permits for rooftop solar PV for more than 50 households. The investment costs went down due to the scaling-effect coming from many individuals working together to install many small solar PV systems. The cooperative also developed one 137 kW solar PV power plant, and have more planned for the future (according to their Strategy for Zero-Emission Island), including a cooperatively owned wind farm, CHP plants and an Educational Centre for RES.

Croatia's first energy independent school

The elementary school in Kaštel Lukšić is a member of a local REScoop and its rooftop is covered in solar PV. A small solar power plant (22 kW) and energy efficient lighting made them the first energy independent school in Croatia. The project was initiated by Energy Cooperative Kaštela and United Nation Development Programme (UNDP) in Croatia in 2014 and the investment was funded by citizens, REScoop members, local authorities and private local companies. This is one of the first examples of local citizens forming an energy cooperative to implement a specific RES project in Croatia**.** Moreover, the project was funded without government subsidies, introducing a new business model that can also be applied in other schools. Within this project the first Croatian donation-based crowdfunding campaign[1] for RES was carried out. Money saved on energy bills is being used to increase the quality of education (new computer labs, excursions, etc.) and school children from Kaštel Lukšić got the opportunity to learn about RES and energy efficiency through first-hand experience. In 2017 the school claimed their first SolarCoins (1 coin for every MWh electricity generated from solar source), motivating their pupils to learn about blockchain technology and alternative finance.

Citizens as investors in green energy

After crowdfunding for RES was introduced in Croatia within the project for an energy independent school, the City of Križevci wanted to encourage their citizens to invest in local RE production. In 2016 the city, together with the Križevci Entrepreneur Centre (KPC) established the Development Centre and Technological Park Križevci, promoting small- and medium-sized entrepreneurship in the food, metal processing, wood and ICT sectors. In order to help the city to boost this initiative, Green Energy Cooperative (ZEZ) developed a project idea for the first crowd investing fund for RES in Croatia. Within this initiative a rooftop solar PV system of 50 kW has been designed for the KPC

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administrative building. The system would meet some of the energy needs of the building and generate monthly savings on the cost of electricity. The capital investment will be co-financed by citizen-investors (loan-based crowdfunding intended to attract citizens who would otherwise put their money in savings funds), the cooperative members and the local authority. The main objectives are to encourage development of small-scale solar PV for own consumption in Croatia (net metering scheme for public buildings, small and medium enterprises etc.), and to introduce alternative finance models into the Croatian energy sector, as well as laying ground to implement blockchain-based pilots in local communities.

Citizen power and the democratisation of energy

There are still many obstacles in Croatian energy legislation to the proper deployment of renewable energy. The quotas for wind and solar energy deployment have had a negative effect on further development of renewable energy in Croatia, particularly on the increase of citizen-owned energy and the development of energy cooperatives. For example, development of solar is currently stalled mainly due to the lack of increase in the PV quota for the feed-in tariff scheme (the set quota was reached), and prosumers and net metering are still not widespread notions in the country. Croatian islands have an extremely high insolation level of 2,300 to 2,800 sunshine hours per year and vast solar energy potential remains locked-up by unfavourable energy policy. Slovenia, for example, has more than 10 times as much installed solar capacity per capita than Croatia. The current subsidy scheme has become an obstacle to expansion of renewable energy, and new models are necessary for successful energy transition. At the moment, legislative changes for small-scale RES for self-consumption are being drafted and they could bring huge positive change, by encouraging citizen-owned energy and by removing administrative barriers for RES (with a focus on small solar PV and biomass co-generation plants).

Citizens organised in an energy cooperative can become a local core of know-how in renewable energy projects and use gained experience for further implementation of community energy. Community energy allows citizens to be directly involved in ownership of or decision making for local projects and can bring financial benefits from RES back to the citizen. Local RE potential is utilised to encourage growth of the local economy, while community energy is encouraging cooperation, social innovation, education, improving local services and local job creation.

Although the energy cooperative success stories introduced above are inspiring, Croatia is still making its first steps towards citizen-owned energy. Public interest in renewable energy is quite strong but RES projects are still reserved for 'big' players – wealthy individual investors and companies, which have the human and financial capital required to overcome administrative difficulties. The United Nations Development Programme (UNDP) in Croatia initiated a project in 2013, 'Energy cooperatives in Croatia'[2], to introduce, test and encourage development of REScoops. As a result, there are today nine energy cooperatives in Croatia, operating as energy start-ups and all of them are experiencing difficulties in carrying out their RES projects because of the current business climate.

Business opportunities for energy coops lay in linking energy and agriculture – several thousand Croatian citizens are members of agricultural cooperatives, generating big potential for building competitive business in deprived rural areas (for example, by implementing renewable energy solutions on family farms).

Local authorities in energy transition

Cities and energy cooperatives can join forces to boost the local economy. Green Energy Cooperative (ZEZ)[3], a Croatian energy coop with the mission of empowering local communities through use of local resources, is working with local authorities to meet their energy and climate goals. ZEZ is partnering up with Energy Cities[4] in the implementation of the initiative Covenant of Mayors in Croatia. Energy Cities carries out activities aimed at discussion and development of solutions in the process of accelerating the energy transition of European cities and municipalities (in over 1,000 cities in 30 EU countries). All activities are based on innovative approaches, new ideas and new practices, aimed at active and continuous involvement of local and regional administrations

and citizens themselves in the fight against climate change.

Energy cooperatives fighting energy poverty

A project funded by the European Social Fund, 'Good Energy in Social Entrepreneurship' is currently being implemented by ZEZ and the Craft College in Croatia. ZEZ fights youth unemployment as well as energy poverty – a team of the cooperative will train 30 young people from three Croatian towns. The project idea is to improve energy efficiency in energy poor households through use of tips and energy efficiency measures, carried out by young and long-term unemployed persons qualified as energy efficiency advisors.

Energy cooperatives as a well-established concept in the European Union

A sustainable energy transition in many EU countries is based on engaging and empowering consumers. Energy cooperatives in Europe first emerged in Denmark in the 1970s, in response to the oil crisis and the envisaged transition to renewable energy sources. Today, the concept of community energy is well established in the country – by 2004 over 150,000 citizens of Denmark were members of energy cooperatives, jointly owning more than 75% of installed wind capacity in the country. Many European countries recognised REScoops as a tool for long-term improvement in the economy, and have made energy cooperatives a common practice, for example Germany, Netherlands, Belgium and Spain. In Germany, almost 50% of installed renewable capacity is in the hands of citizens, energy cooperatives and farmers while big utilities own less than 6% of installed RES, and only a few years back they were oligopolies in the electricity production. REScoop.eu[5] is the European Federation of Renewable Energy Cooperatives, linking 1,500 European REScoops and 1,000,000 citizens, members of energy cooperatives.

Energy cooperatives getting introduced in the Western Balkans

A comparative study on energy cooperatives in Eastern Partnership countries and the Western Balkans have been developed[6] by WECF Germany and ZEZ in 2017. The study focuses on REScoops as one important instrument for community energy and renewable energy transition in these regions. Important variables in introducing and promoting energy cooperatives include: government support mechanisms for RES and community energy projects, drafting new strategies and action plans, changing attitudes towards the cooperative model, and promoting local energy activism.

GIZ Office Bosnia and Herzegovina is currently conducting the project 'Promotion of Renewable Energy in BIH', designed to create and strengthen the framework preconditions for the increased use of RES in BIH. Within this project, ZEZ is developing effective business models for financing RE projects and inclusion of local communities in RE projects, and recommendations for a legal framework that encourages community energy in Bosnia and Herzegovina. This cooperation will foster exchange of know-how and best practices between the countries.

Policy support for community energy

The 'Winter Package' of the European Commission (Clean Energy for All Europeans)[7], states that new energy policies cannot be implemented without the support of citizens. National policy decisions have a strong impact on the development of citizen-owned energy and energy cooperatives. Local governments can also do much to advance support for community energy. The Scottish government set a target of 500 MW of community and locally-owned renewable energy by 2020 and, through systematic financial and technical support, the goal has already been reached. In Denmark, for example, a citizen needs simply to sign a few documents to become an energy cooperative member and buy a share in a wind power plant. Wind farm developers in Denmark are obliged to offer shares worth at least 20% of the total project to the local community.

Croatian legislation does not look favourably upon active citizen participation in the development of renewable energy. UNDP Croatia, in cooperation with international and national partners, drafted recommendations to encourage the development of energy cooperatives in the country in 2015.[8]

These guidelines are designed to help improve legislation and encourage citizen participation in renewable energy projects. Inspired by the Danish cooperative model, Croatia can make it obligatory to offer citizens shares in commercial RES projects. Croatia can also introduce net metering with a netting period of one year and with better administrative support for households, based on good practice from Slovenia and the Netherlands. Additionally, based on the UK experience, Croatia could designate a special quota for community renewable energy (e.g. for wind and solar). Simply providing information is not enough - citizens should be actively involved in the decision-making process and energy ownership for the renewable energy transition to be successful

Renewable energy development in Croatia and the Western Balkan countries should be led by citizens and local renewable energy cooperatives, rather than big (often foreign) investors and companies. This way benefits generated from the local potential remain in the hands of the local community.

Most of today's cooperative members in Europe are motivated citizens focused on generating change in their local communities. Renewable energy should not be seen as another obligation imposed on our struggling economies by the European Commission, but rather as an opportunity to address social, economic and environmental challenges. Only citizens can transform our import-dependent energy system and protect out waters, air and soil – by choosing an alternative to dirty and expensive fossil fuel-fired power plants.

1 For the crowdfunding site, see https://www.indiegogo.com/projects/energy-independent-school
2 http://www.hr.undp.org/content/croatia/en/home/operations/projects/environment_and_energy/energy_cooperatives.html
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8 Available at: http://www.hr.undp.org/content/dam/croatia/docs/Research and publications/environment/UNDP-HR_Krk recommendations_final_rp_SV_MD_MK.pdf

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