

COVID-19

Power and utilities

Impact of COVID-19 and Economic Downturn on South-East Europe Power and Utility Sector



Prepared by:

Mislav Slade-Šilović, PwC SEE Energy leader

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PwC perspective

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1

Executive summary

The P&U sector is facing disruption across the value chain, however the impact of the crisis is so far moderate compared to other sectors

Overview of COVID-19 impact on Power and Utilities (1/2)

Area	Key insights
Overall industry impact	<ul style="list-style-type: none">• The impact of COVID-19 on supply and demand for the power sector on a global scale is estimated to be in the lower-middle range• European utilities suffered a market cap crash of ~25% (lower than S&P 500 index) at the beginning of the crisis, but are now slowly recovering• CEO agenda has not fundamentally changed with the crisis; decarbonisation, decentralisation and digitisation remain top priorities
Consumption and customer behaviour	<ul style="list-style-type: none">• Total electricity demand in SEE has been dropping ~20% on a weekly basis since the crisis started (and ~10% compared to the same period last year)• We have seen a shift in households vs. industry and services consumption, due to lockdown measures across the region• Level of short-term economic recovery and the tourist season will be key factors in determining further demand development in 2020
Supply and power generation mix	<ul style="list-style-type: none">• Downward pressure on electricity generation caused by lower demand, market prices and bad hydrology has been partly offset by cheap gas• We have seen a slight increase in electricity generation from solar and wind• Power plants are working normally according to a planned schedule and stable maintenance activities



New reality has forced regional utilities to adjust their operations, with focus on supply continuity and customer protection

Overview of COVID-19 impact on Power and Utilities (2/2)

Area	Key insights
Prices and market	<ul style="list-style-type: none">• Spot price on all SEE markets is highly volatile and decreased by 46% from February to April• Decreasing spot prices present an opportunity for import, while exporters need to consider using trading instruments for hedging• Despite current low wholesale prices, market expectations are that prices will return to pre-crisis levels in the second half of the year
Corporate reaction	<ul style="list-style-type: none">• Regional utilities have successfully adapted to the ‘new normal’ by going digital and introducing stricter worker safety measures• Some companies entered into contract renegotiations with suppliers or activated back-up options due to minor supply chain delays• Companies are now primarily focused on stabilising their liquidity, while major capital projects are continuing with minor delays
State response	<ul style="list-style-type: none">• EU leaders aim to continue with the Green Deal agenda as planned, with the EC announcing that COVID-19 will not affect the Deal’s timeline• EU leaders called for governments to step up their climate ambitions and launch sustainable stimulus packages• Additionally, most SEE countries have taken payment relaxation measures to protect customers



In the short-term, utilities need to focus to managing liquidity, optimizing costs and increasing operational efficiency

Key short term **action** steps for P&U companies

Crisis stage	Response	Key actions	Timeline
 Disruption	Mobilize	<ul style="list-style-type: none">• Develop a holistic understanding of the business environment• Manage cash collection and liquidity risk• Assess company's exposure and resilience capabilities• Protect vulnerable customers with payment flexibility options• Diversify sourcing in case of supply chain disruptions• Prepare contingency plans for shifts rotations• Adjust outage planning and management• Review plans and prepare contingency for large capital projects	1-2 months
 Recovery	Review costs & restructure	<ul style="list-style-type: none">• Conduct short term cost review and optimisation, including:<ul style="list-style-type: none">○ Optimization of field force productivity and costs○ Elimination of shadow functions and unnecessary layers○ Centralization of support activities○ Rationalization of project portfolio and elimination of redundant / non-strategic activities• Incorporate physical risks such as pandemic, climate change into trading models and develop contingency plans	<6 months

Going forward companies need to think about stabilizing the core and developing new (digital) business models

Key mid to long-term **action** steps for P&U companies

Crisis stage	Response	Key actions	Timeline
 Stabilization	Accelerate growth initiatives	<ul style="list-style-type: none">• Align your operating model to support stabilization and growth• Re-assess the portfolio of conventional power generation plants• Leverage the scale, capabilities and financial position to increase investments in RES technologies• Leverage cheap financing to expand and improve T&D network performance• Invest in asset management tools to improve efficiency and ROI• Focus on developing „behind the meter” energy services	6-18 months
 Resilience	Innovate & digitize	<ul style="list-style-type: none">• Digitize core operational processes by introducing data-driven controls and maintenance• Enhance investments in SCADA• Introduce production automation• Digitize support processes and customer service through shared data platform, RPA, automated customer interaction etc.• Enhance digitally-enabled innovations	18-36 months

The background of the slide is a dark gray network diagram. It consists of numerous small square nodes, some of which are red and others are white. These nodes are interconnected by a web of thin, light gray lines, creating a complex, interconnected pattern that resembles a global network or a social media graph. A large, white, stylized number '2' is positioned on the left side of the slide, partially overlapping the network. To the right of the number, there is a red rectangular box containing white text.

2

Global impact of
COVID-19

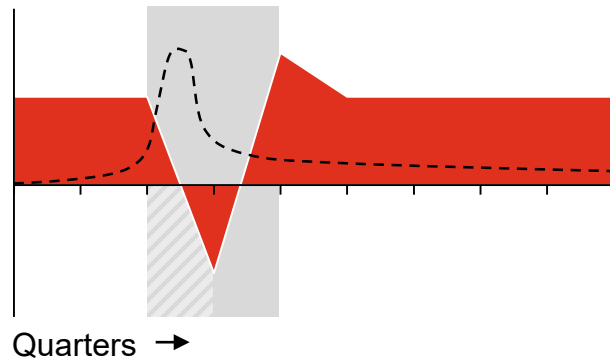
PwC has developed three indicative scenarios of economic development for the upcoming quarters

ILLUSTRATIVE

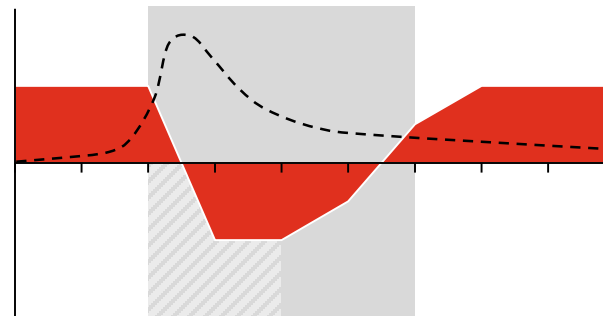
PwC indicative scenarios for overall economy (as at April 2020 - uncertain which scenario will emerge)

V-scenario

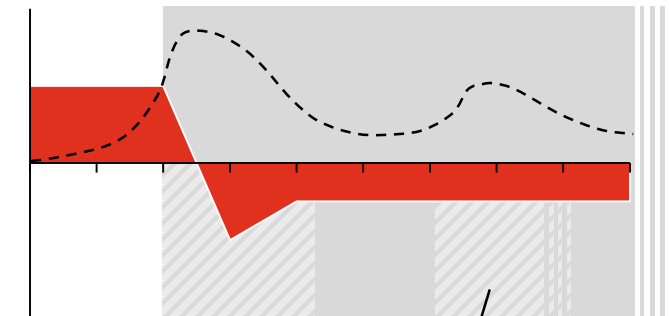
GDP change (quarterly)



U-scenario



L-scenario



E.g. W-shaped infections curve and second lockdown

■ = crisis and recovery period ■ = lockdown period - - - = infection curve¹⁾

- **Lock-down** period limited to **one month**
- **Shock impact** on the economy as a whole, followed by **swift and complete recovery**
- Full-year **growth reduction limited to one year**
- **Postponement** of investment and consumption **rather than cancellation**

Mild

- **Lock-down** period for up to **2-3 months**
- **Sustained recession**; return to previous GDP level over several quarters
- Overall **growth** of at **least two** full **years** affected
- Postponement and, in part, **sustained restriction of investment and consumption**

Severe

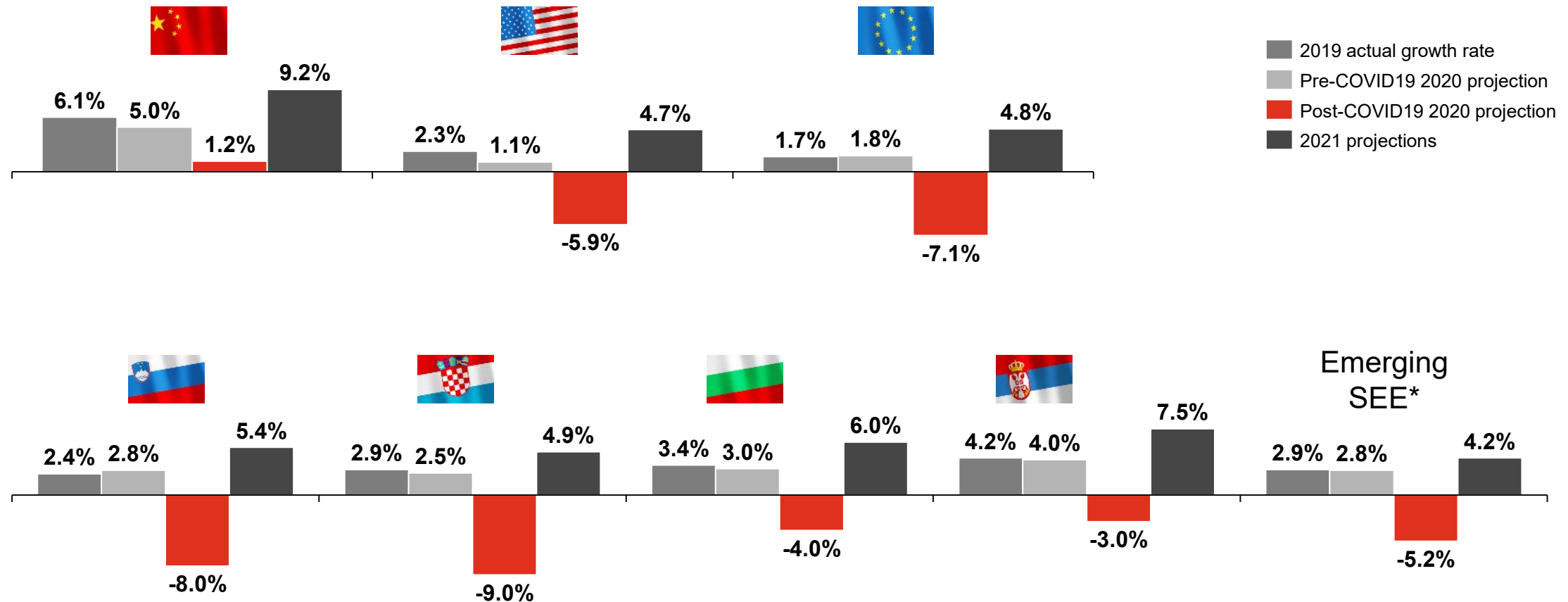
- **Lock-down** period until the **end of August**
- **Drastic impact** on economy and **prolonged recession**; threats to monetary / financial system
- **Return** to the level of total output before COVID-19 **not foreseeable**
- **Deep restrictions** on investment / consumption

Drastic

After the initial economic downturn, the gradual recovery is expected in 2021, both globally and in SEE

INDICATIVE

IMF projected COVID-19 impact on the global economy as per V-shape scenario (GDP growth rate)



Note: *Emerging SEE includes: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia. Latest official Croatian forecast for 2020 is -9.4%

Source: International Monetary Fund, PwC analysis

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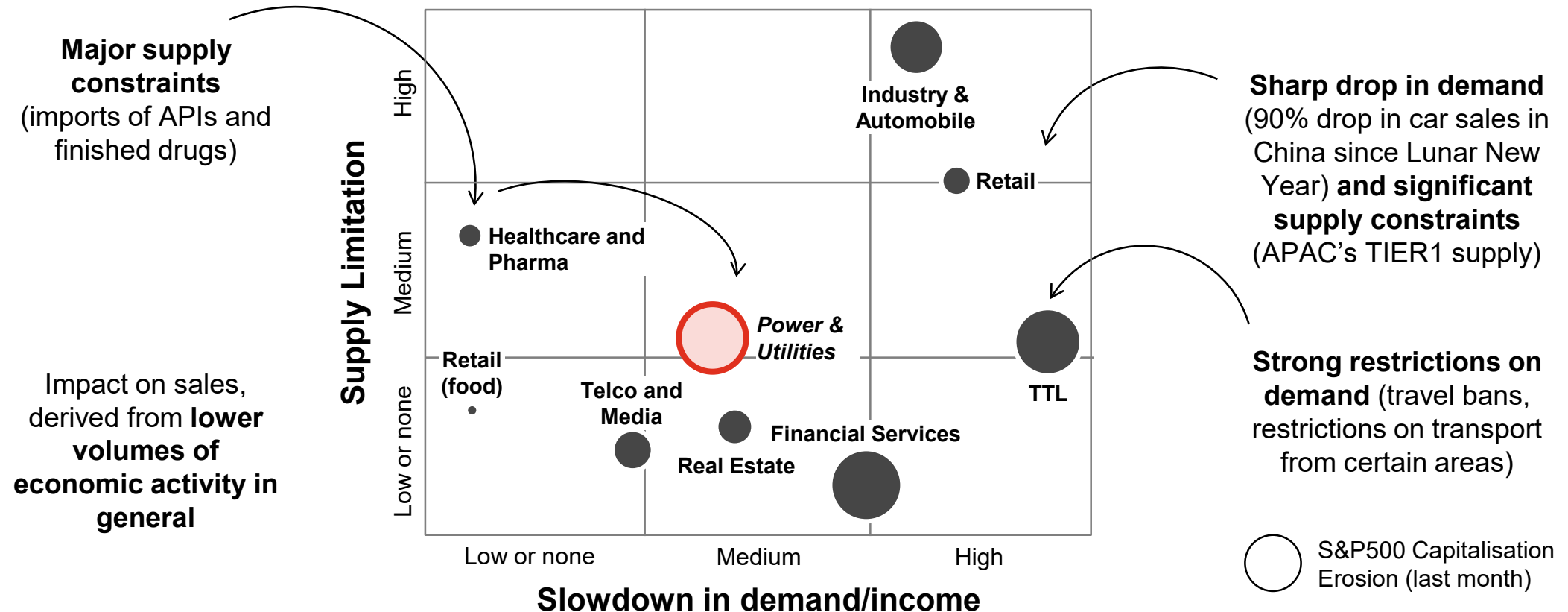
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Impact on the
SEE P&U sector

Globally, the impact of COVID-19 on the power and utilities sector is estimated to be in the lower-mid range...

INDICATIVE

Impact of COVID-19 on main sectors of activity



Unfavourable market conditions can magnify cash flow stress or excess debt

Source: PwC analysis

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...nevertheless, P&U CFOs are concerned about current liquidity issues and long-term economic impact

Overview of top concerns regarding COVID-19
(% of total surveyed CFOs¹)

75%

Liquidity and other financial impact

70%

Potential global recession

41%

Reduced productivity

39%

Reduced consumption

21%

Supply chain disruptions

20%

Lack of information

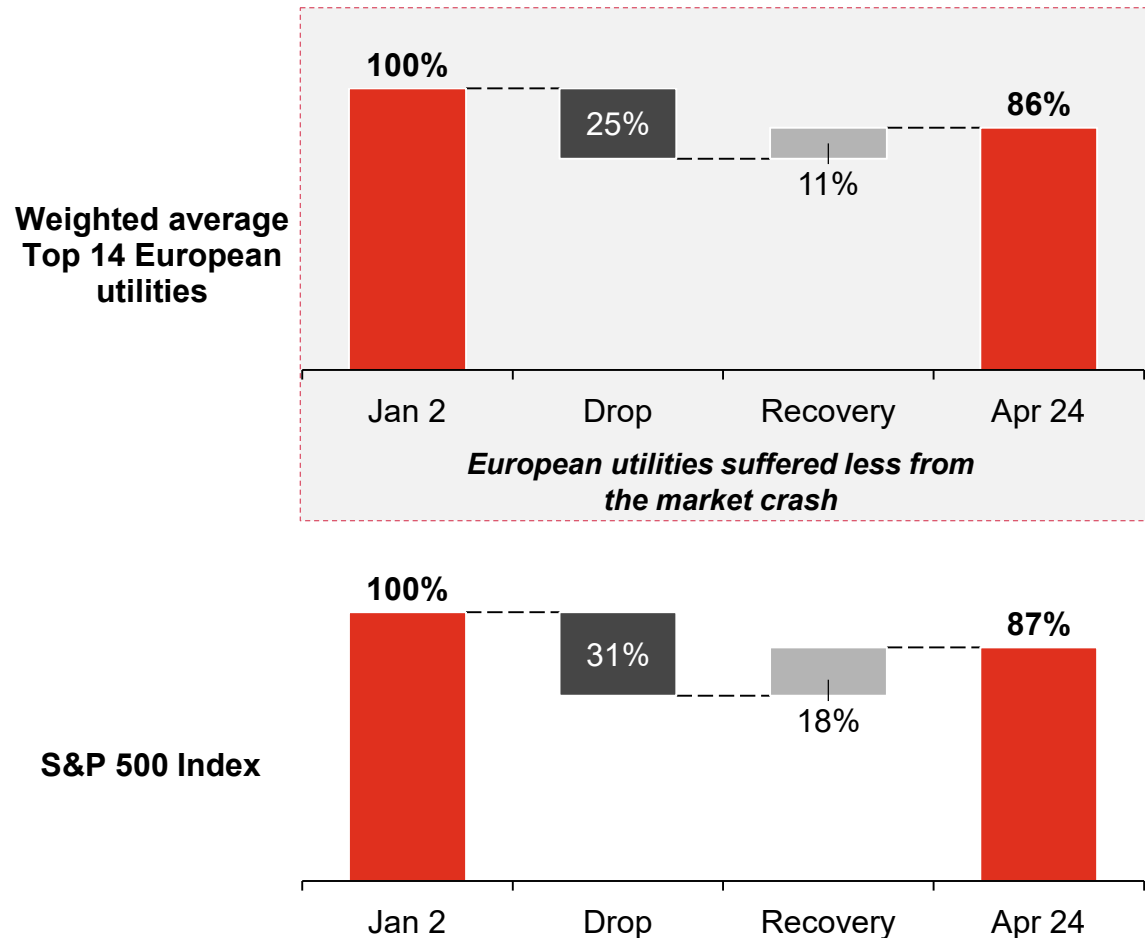
"No crisis is an isolated, neatly contained incident, and COVID-19 outbreak is exceptional by any standards. It comes with extreme scope and levels of uncertainty."

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1) Each surveyed CFO could choose up to 3 responses to the survey, % share represents how many of total surveyed CFOs chose each concern as one of their responses
Other concerns include: cybersecurity risks; fraud risks; impacts on tax, trade or immigration; privacy risks
Source: PwC analysis

Although more resilient than S&P 500, European utilities have suffered strong market cap crash since the crisis start

Market cap or Index on 24 April as % of 2 Jan 2020



Relative resilience of European P&U vs. S&P 500

- Utilities are considered an essential service, hence suffer less from demand contraction than other industries
- Many activities are regulated or carried out under long-term or hedged contracts
- Continuity of supply is ensured as utilities many have elaborated contingency plans to manage disruption and protect critical infrastructure
- Over the past week, European utilities have been able to raise EUR billions in new debt, shoring up their finances to tackle the challenges they face because of this crisis
 - Many bonds were oversubscribed, indicating continued interest and trust in the resilience of this market from investors
 - Utilities will not likely have difficulty accessing the capital market in the near future

Source: Bloomberg, S&P, SP Global; Strategy& analysis

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Nevertheless, key ambitions, strategic directions and CEO agendas haven't fundamentally changed

P&U megatrends and CEO agenda



Decarbonisation

- International efforts to **reduce CO₂ emissions from source to socket** through government policy, regulatory actions and private sector efforts to develop renewables
- Growth of **low marginal cost, intermittent renewable energy** sources destabilising peak/off-peak spreads



Decentralisation

- Emergence of smaller scale renewable power **generation facilities close to consumption** sites and increase in two way energy transmission
- **Rise of viable storage technologies**, improving usability of intermittent RES and contributing to positive distributed energy resources (DER) business cases



Digitisation

- **Introduction of new technologies**, catalysing the rise of alternative products and new digital ecosystems
- Expansion of **digital transformation agendas** across all sectors, and increasing use of technology to enhance each segment of the energy value chain (e.g. smart metering, M2M communication)

CEO thoughts

"We are advancing with our investments in renewables, spending €10 bn in 2020 and surpassing last year's investment, to contribute to the economy and boost employment."

Large Spanish utility company CEO

(2 April, 2020)

"We think there will be a need for investment to restart after a period of low growth. This could be a perfect opportunity for renewables to pick up speed again"

Large Italian utility company CEO

(20 March, 2020)

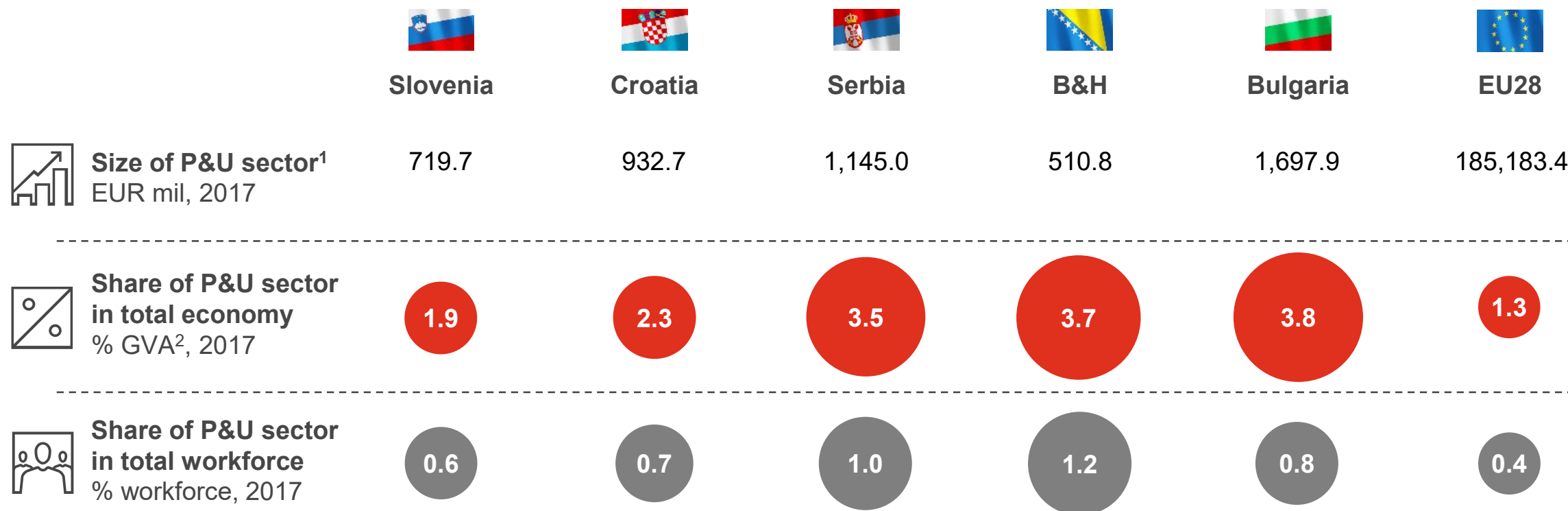
"After the current crisis, ... , network expansion and the installation of climate-friendly energy infrastructure will surely be even more crucial. "

Large German utility company CEO

(24 March, 2020)

Regional power and utility sector has a fairly significant role in the overall economy, which makes it a very relevant economic lever

P&U sector share in overall economy



1) Value added at factor cost of electric power generation, transmission and distribution sector, as per Eurostat NACE sector distribution

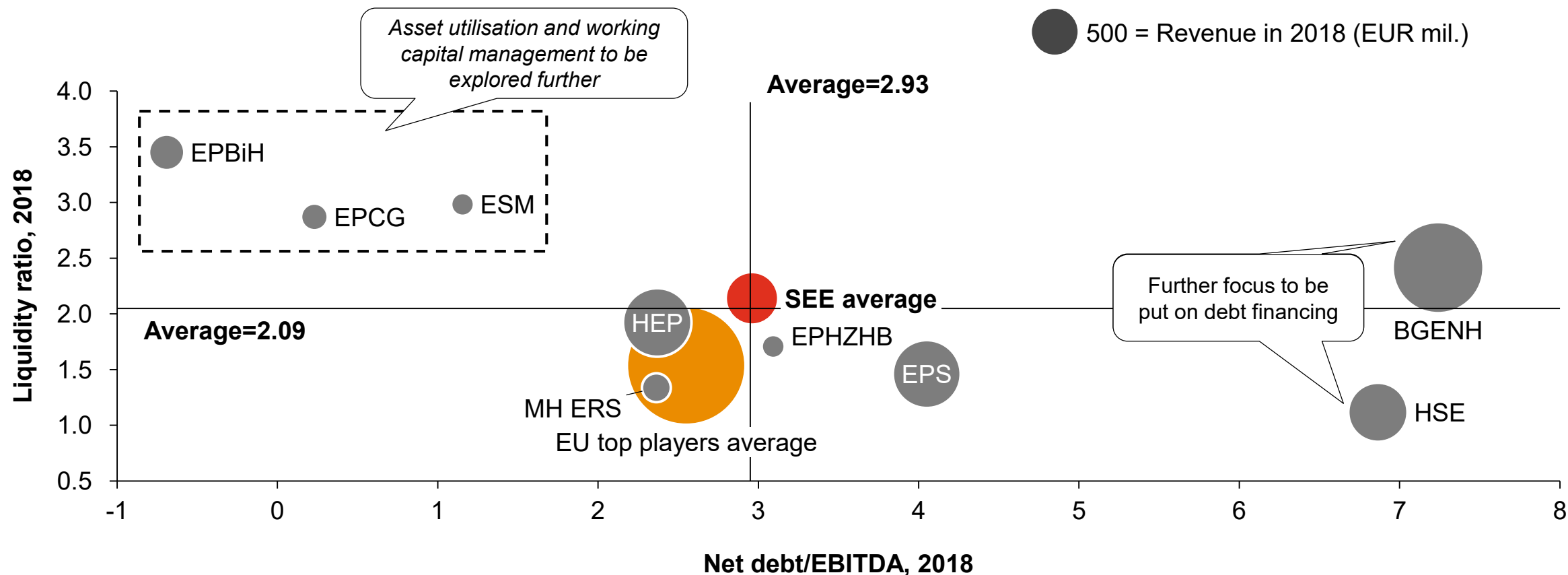
2) Gross value added

Note: Data for other SEE countries is not available

Source: Eurostat, World Bank, PwC analysis

Based on historical performance, SEE utilities might be less resilient to market shock than their European peers...

Financial resilience of SEE energy companies and European best practice



Note: As companies have different level of vertical integration, purpose of this chart is not a comparable benchmark, but rather an individual overview of current resilience position

Source: Company financial and annual reports, PwC analysis

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...with some companies more exposed to liquidity, cash flow, and debt financing challenges

Key performance indicators of SEE utilities (2018)

KPI	HEP	HSE	EPS	MH ERS	EP B&H	EPHZHB	EPCG	ESM	BGENH	SEE mean	EU top players average ¹
Operating efficiency (Net income / Revenue)	9%	-1%	-1%	2%	5%	4%	15%	12%	-4%	5%	12%
Cash ratio (Cash and cash eq. / Current liabilities)	0.78	0.30	0.33	0.15	1.19	0.13	0.30	0.17	1.15	0.50	0.26
Liquidity (Current assets / Current liabilities)	1.92	1.12	1.46	1.34	3.45	1.71	2.87	2.98	2.42	2.47	1.54
Cash flow coverage (Op. cash flow / Total liabilities)	24%	20%	17%	15%	44%	9%	50%	16%	6%	22%	11%
Current liability coverage (Op. cash flow / Current liabilities)	100%	74%	66%	47%	206%	43%	155%	74%	32%	89%	47%
Debt to equity (Total liabilities / Equity)	0.66	0.96	0.39	0.23	0.14	0.50	0.16	0.42	0.56	0.45	1.57
Assets to equity² (Total assets / Equity)	1.66	1.96	1.39	1.23	1.14	1.50	1.16	1.42	1.56	1.45	6.38
Return on equity (Net income / Equity)	6%	-1%	0%	0%	2%	2%	5%	5%	-2%	0%	41%
Asset use efficiency (Revenue/ Total assets)	38%	70%	19%	16%	31%	35%	27%	29%	39%	34%	55%

1) Includes E.ON, RWE, Iberdrola, ENEL, EDF, Vattenfal and Engie






















2) Assets to equity ratio is not color coded across performance as interpretation of this ratio highly depends on several other indicators and company's strategy in this concern

Source: Companies' financial reports, PwC analysis

Leading Middle Slightly lagging Lagging

Regional utilities are affected by the crisis across the value chain, with demand drop and price volatility leading the way

Overview of COVID-19 impact across key categories in Q1 2020

Category	 Consumption and customer behaviour	 Supply and power generation	 Prices and market	 Corporate reaction	 State response
Key takeaway	<ul style="list-style-type: none"> Economic slowdown has decreased the overall electricity consumption Demand structure has changed, with household segment growth compared to others 	<ul style="list-style-type: none"> Coal and gas generation was stable due to bad hydrology in SEE In Europe, we see stronger drop of conventional technologies 	<ul style="list-style-type: none"> Regional PX spot prices dropped ~50% since crisis start, with Q3 and Q4 futures stable for now In case of further imbalance and volatility, export oriented utilities could be at risk 	<ul style="list-style-type: none"> Work went digital with more safety measures for field operations Liquidity is #1 priority now, with some cost rationalisation Capital projects are currently not postponed 	<ul style="list-style-type: none"> Governments have introduced payment relaxation measures to protect customers The EU leaders are calling for collective efforts to continue the energy transition as planned
COVID-19 impact	High	Low / Medium	High	Medium	Medium
Impact magnitude for P&U					
P&U most impacted area	 Revenue  Profitability	 Operations  Profitability	 Revenue  Profitability	 Cash  Operations  OPEX	 Revenue  Cash

Source: PwC analysis

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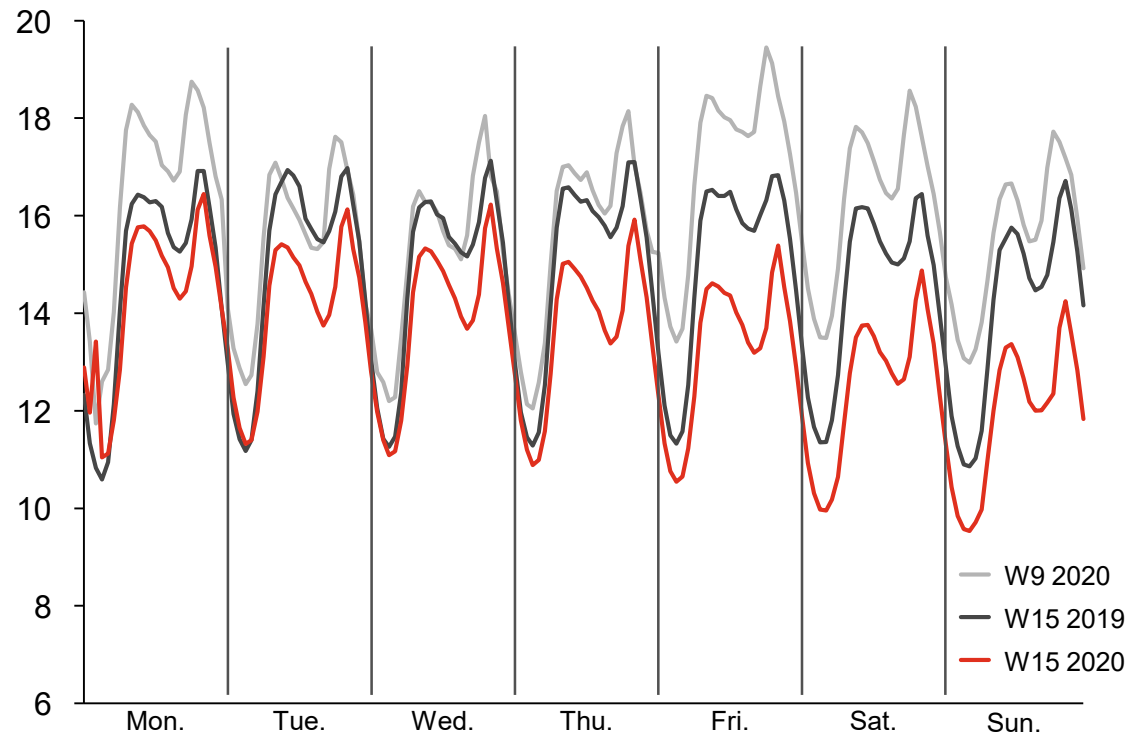
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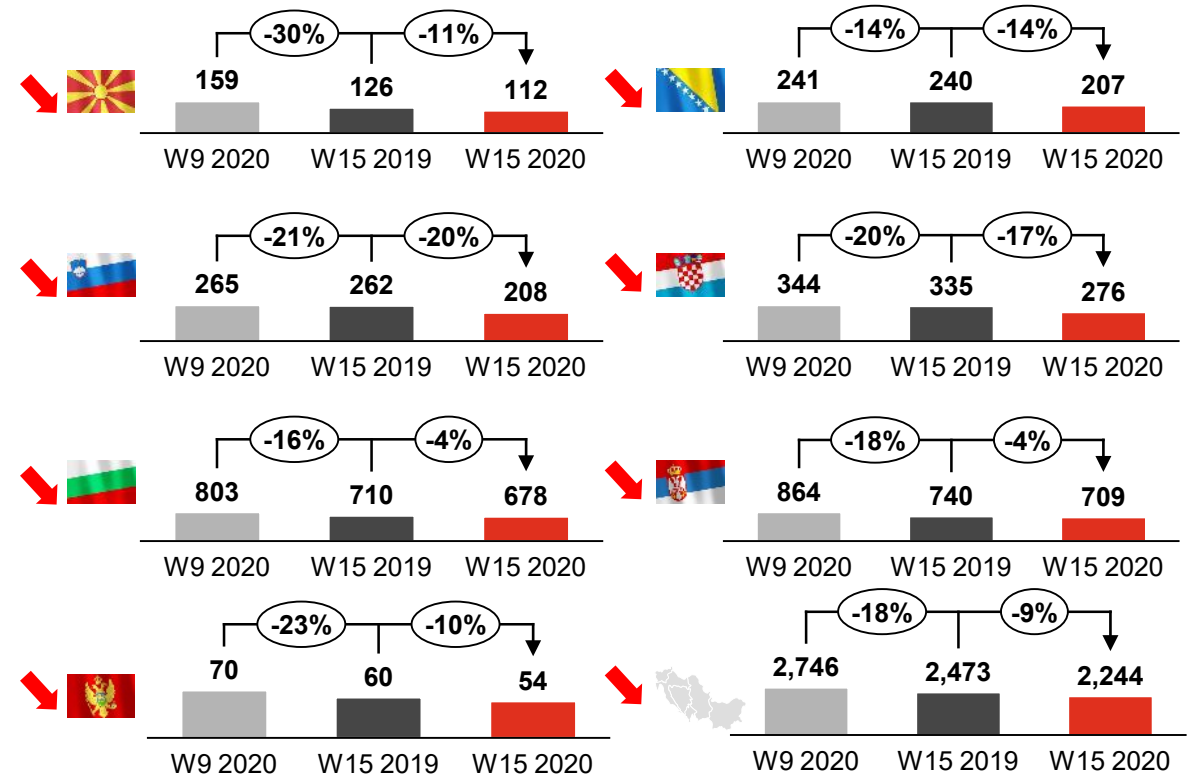
Electricity demand in SEE has followed the global and European trend of substantial decrease since the crisis started

SEE electricity demand (GWh)

Hourly electricity demand comparison – total SEE¹ (GWh)



Weekly electricity demand by country (GWh)



Development of future electricity demand is highly dependent on the dynamics and scenario of economic recovery in the region.

Source: ENTSO-E, PwC analysis

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W9 2020 (24/2-1/3) - Week before crisis start, 1st COVID case in the region

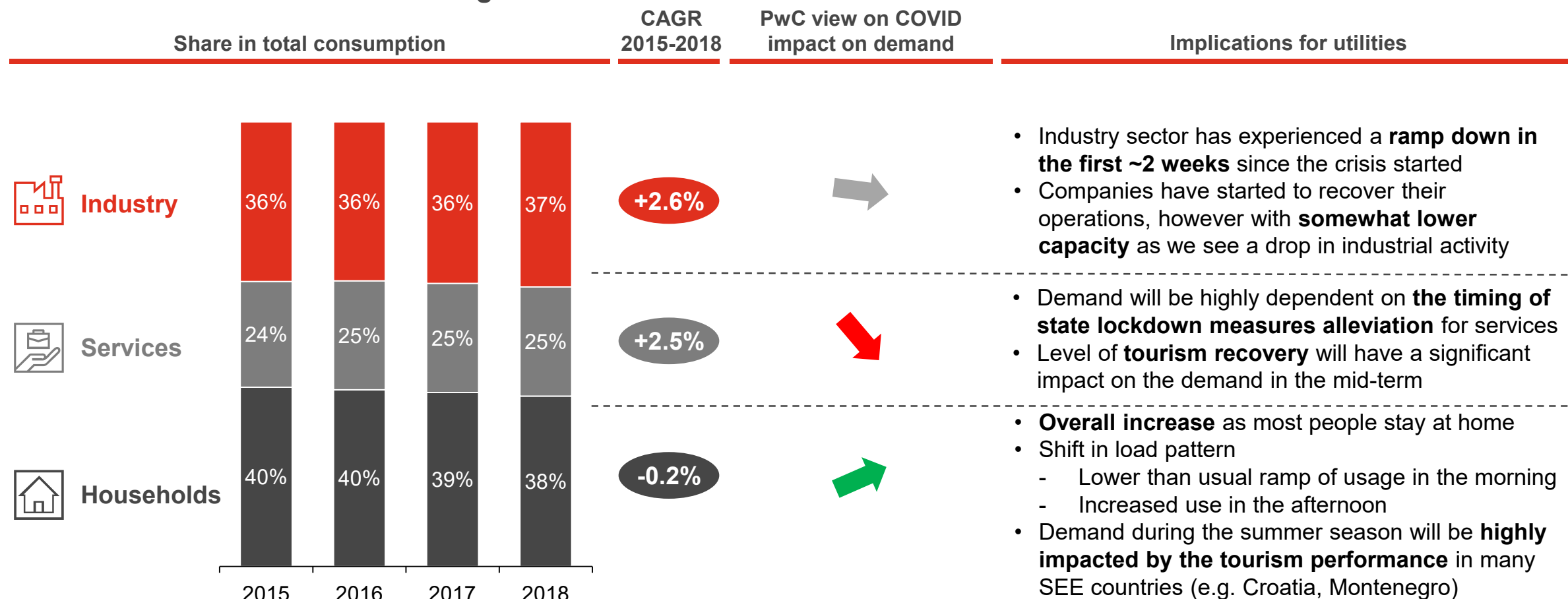
W15 2020 (6/4-12/4) – One month into the lockdown across region

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Demand from services has been affected the most, while industry has begun increasing its activity in reduced capacity

SEE demand shifts across main segments



Source: Eurostat, PwC analysis

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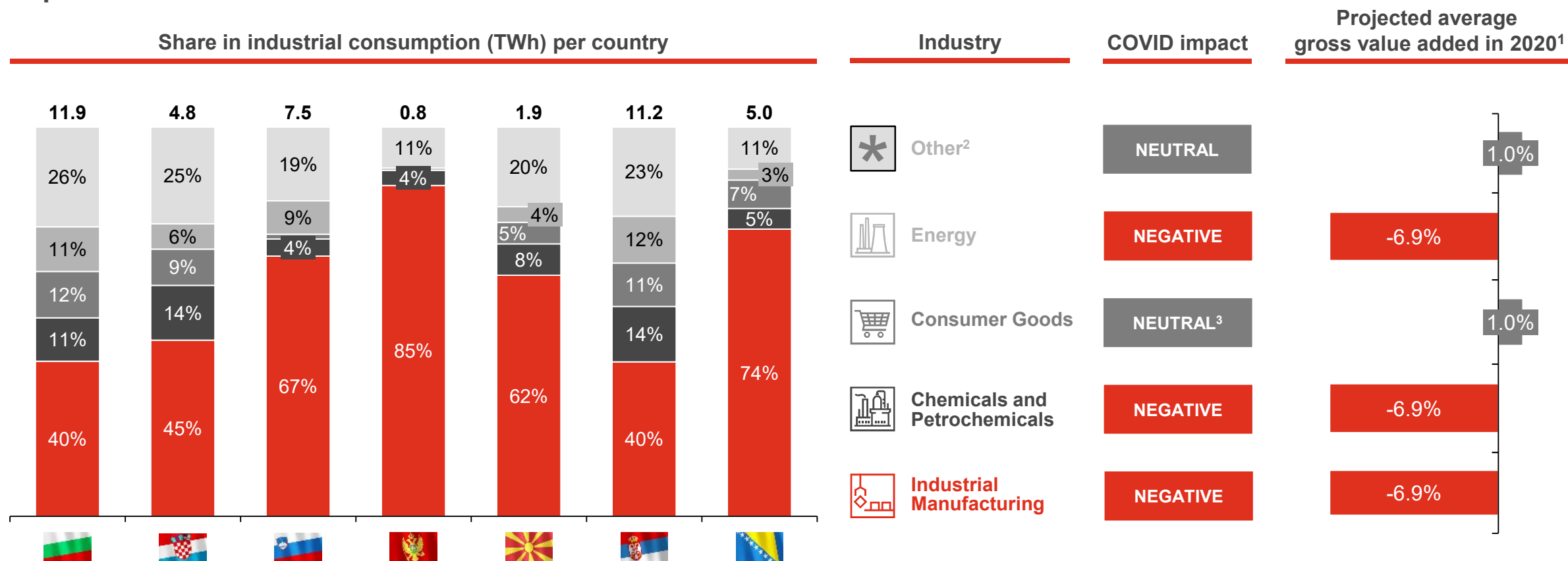
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Analysis indicate that energy intense industries will be hit the most with the ongoing crisis, thus driving down electricity demand

Impact of COVID-19 on SEE industries



1) Based on PwC Strategy& study: „Assessing the impact of COVID-19 on various industries in Europe”; average calculated from projected GVA for different scenarios

2) Others include: Mining and Quarrying, Wood and Wood Products, Construction, Transportation, Agriculture, Forestry, Fishing and Not Specified industries

3) Adjusted for SEE, varies depending on country dependency on tourism

Source: Eurostat, PwC analysis, Strategy& study: „Assessing the impact of COVID-19 on various industries in Europe”



Economic slowdown has caused a mild decrease in electricity consumption, but outlook for second half of the year is still unclear

Management views from several SEE power utilities

How much is the economic slowdown in this crisis impacting electricity consumption?

"The lockdown has caused a slight demand drop but there are no significant disruptions for now"

"For April, we are expecting a shift in households vs. industry consumption towards households which will impact our revenues due to low prices in households segment"

"In case of consumption swaps between household and industry/services segment, we don't expect any severe hits on our revenues, as the prices are relatively similar"

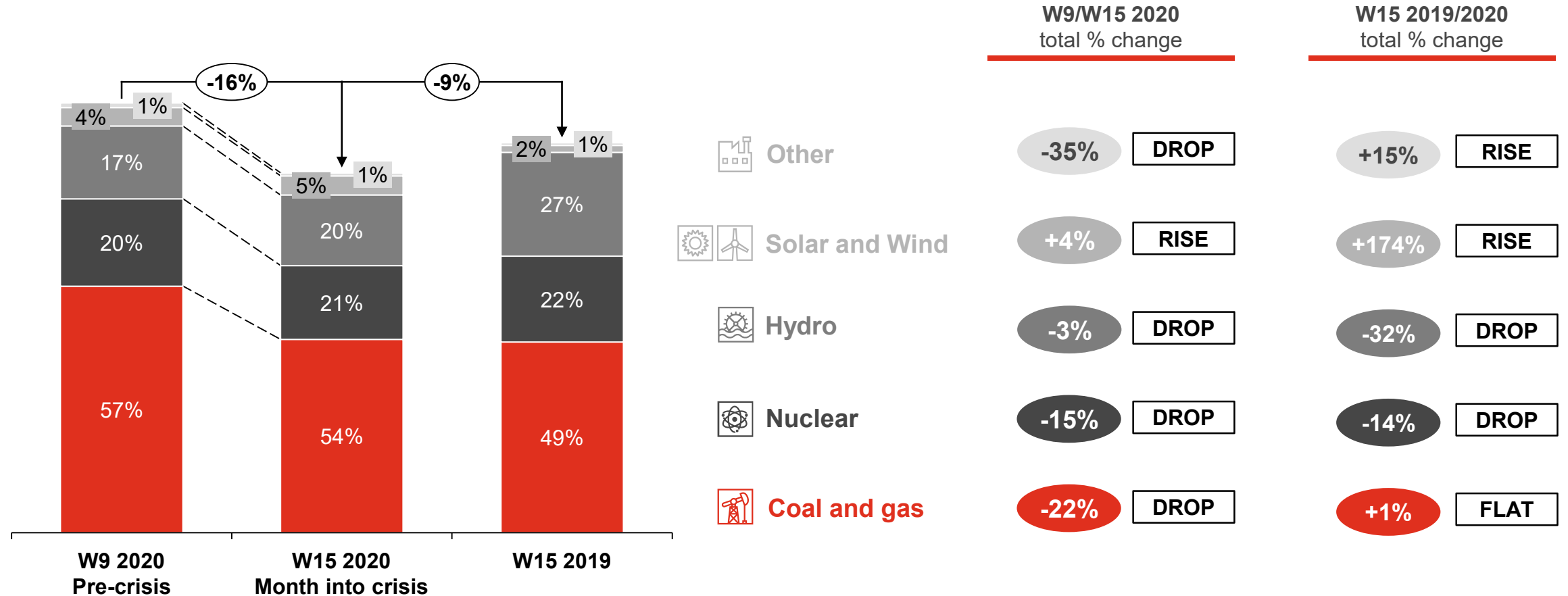
"We did not experience any major consumption decreases from industry and services in February and March, however households have been more active as people are staying more in their homes"

"The biggest question for us is how much will a slower tourist season affect the overall consumption during summer months"



Downward pressure on electricity generation caused by lower demand, market prices and bad hydrology has been partly offset by cheaper gas

Weekly electricity generation in SEE (GWh)



Note: Data for Croatia was not available

Source: ENTSO-E, PwC analysis

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Flexible structure of regional power generation mix has played important role in coping with the market turmoil

Management views from several SEE power utilities

Are there major shifts in your power generation portfolio like in rest of Europe with higher share of renewables?

"Power plants are working normally, according to planned schedule"

"Unfavourable hydrology lowered the overall hydro generation potential in the region by 30%"

"Generation capacities are available with stable maintenance activities"

"Yes, the hydrology is lower than planned but we are using our hydro accumulation now to prepare for more extreme summer months"

"Historically, low oil prices have certainly made an impact on cheaper natural gas prices. This allowed us to modify our generation plan for a CHP plant for the upcoming month"

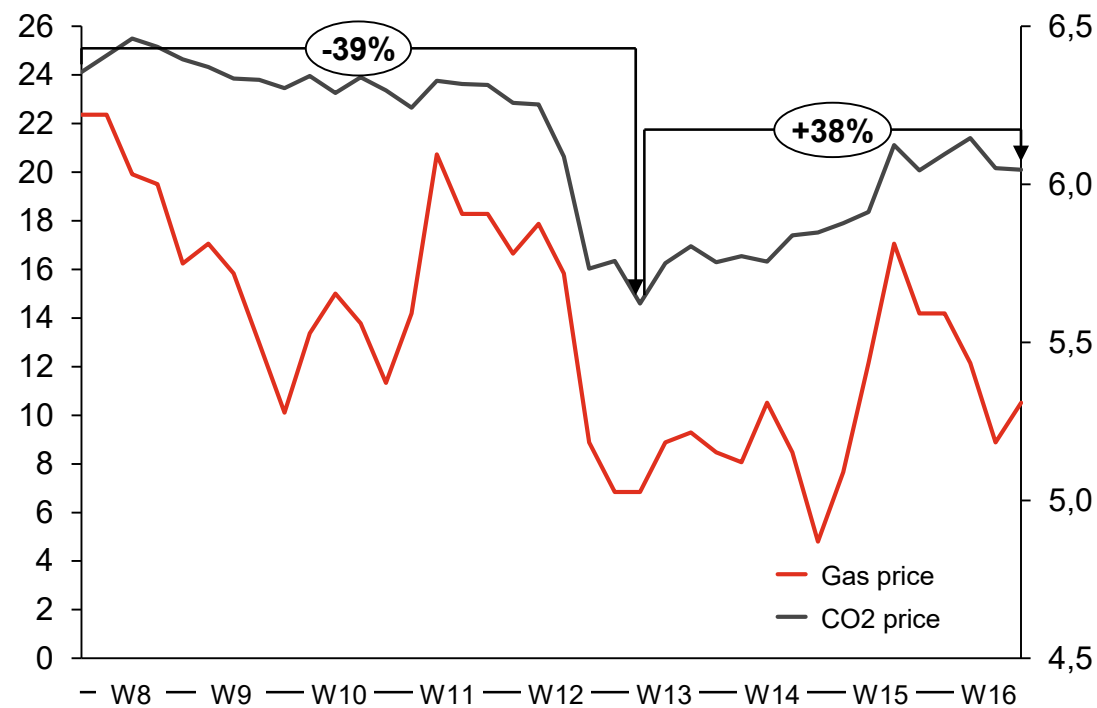


Although in the short term CO₂ prices plummeted, it is expected that in the mid-long term trend will remain stable

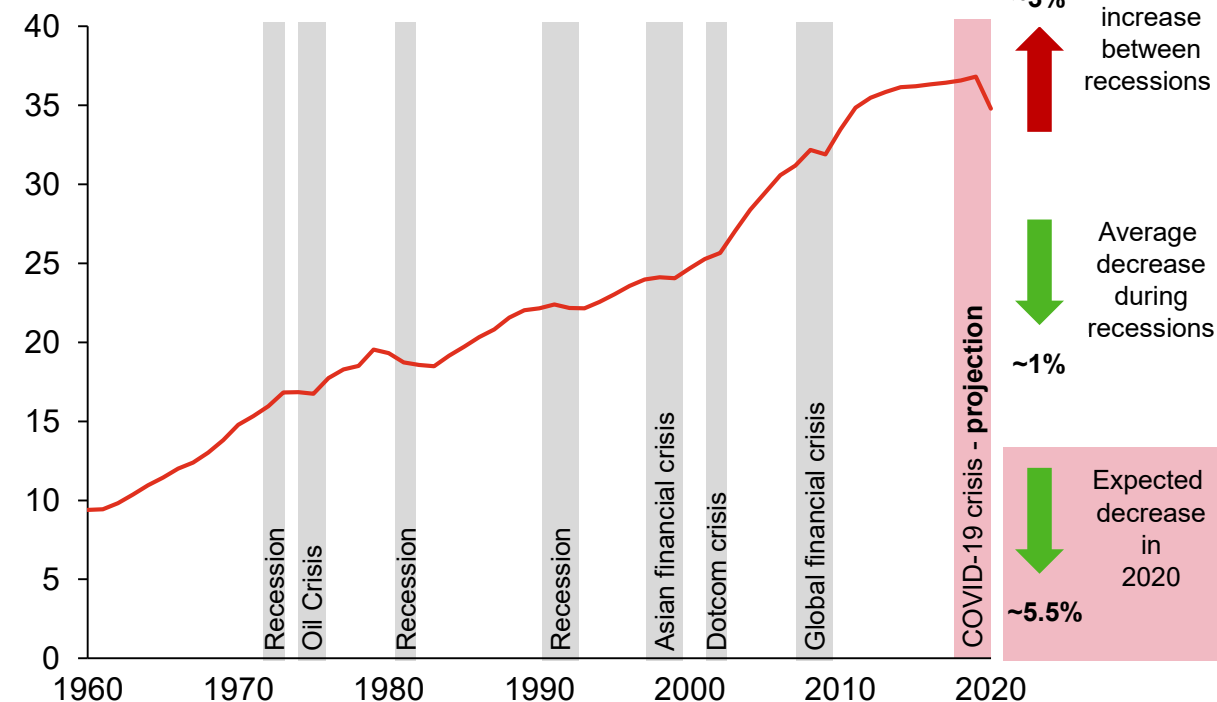
The slowdown in demand has decreased CO₂ auction and gas prices by ~40% and ~20% respectively...

...but as the emissions continue to grow after the crisis, the prices are expected to grow again

Daily auction price
EUR/t CO₂



Global CO2 emissions
In billion metric tons



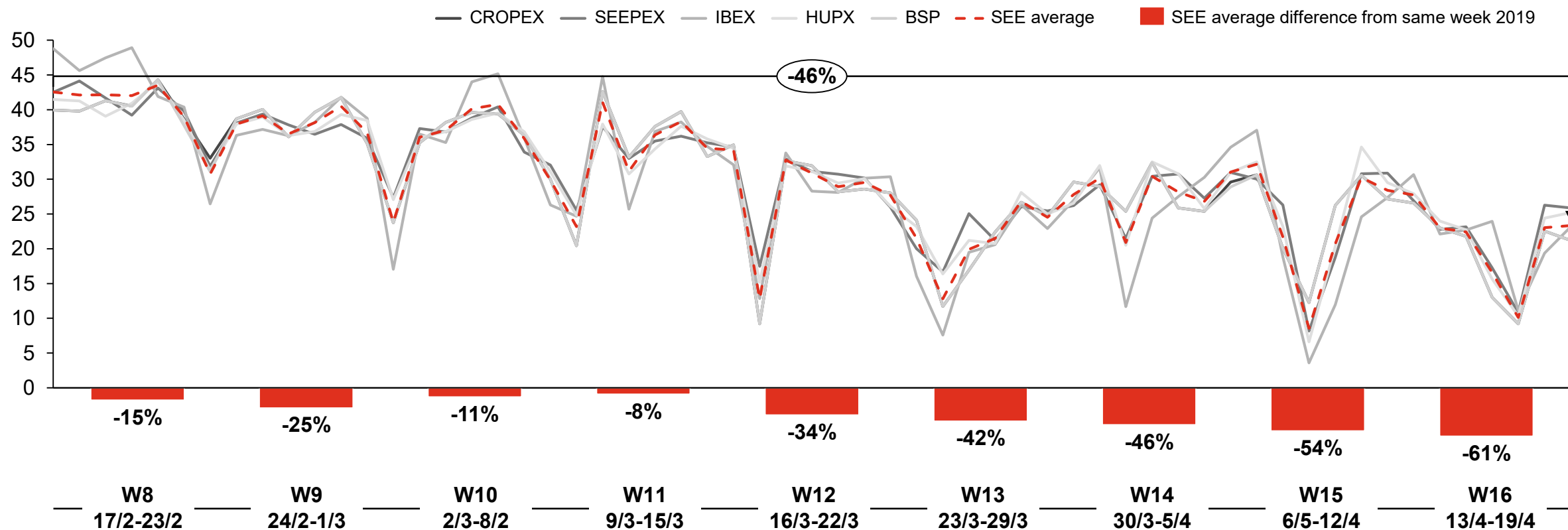
Note: US market data was used for coal and natural gas prices
Source: The World Bank, Carbon Brief, MarketsInsider, PwC analysis

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Spot prices on all SEE markets are very volatile with ~50% drop in the last two months

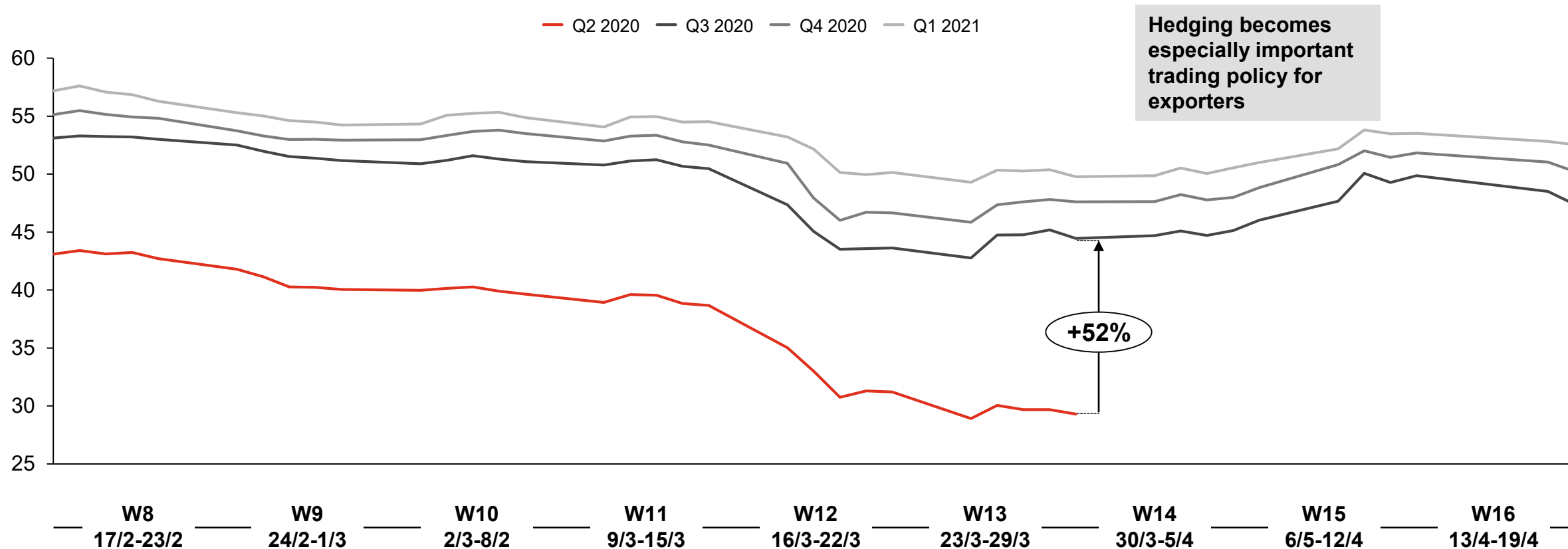
Electricity spot price on SEE power exchange markets (EUR/MWh)





Nevertheless, according to the pool price futures, market is still optimistic from Q3 2020 going forward

Electricity price futures (EUR/MWh)



Source: HUDEX

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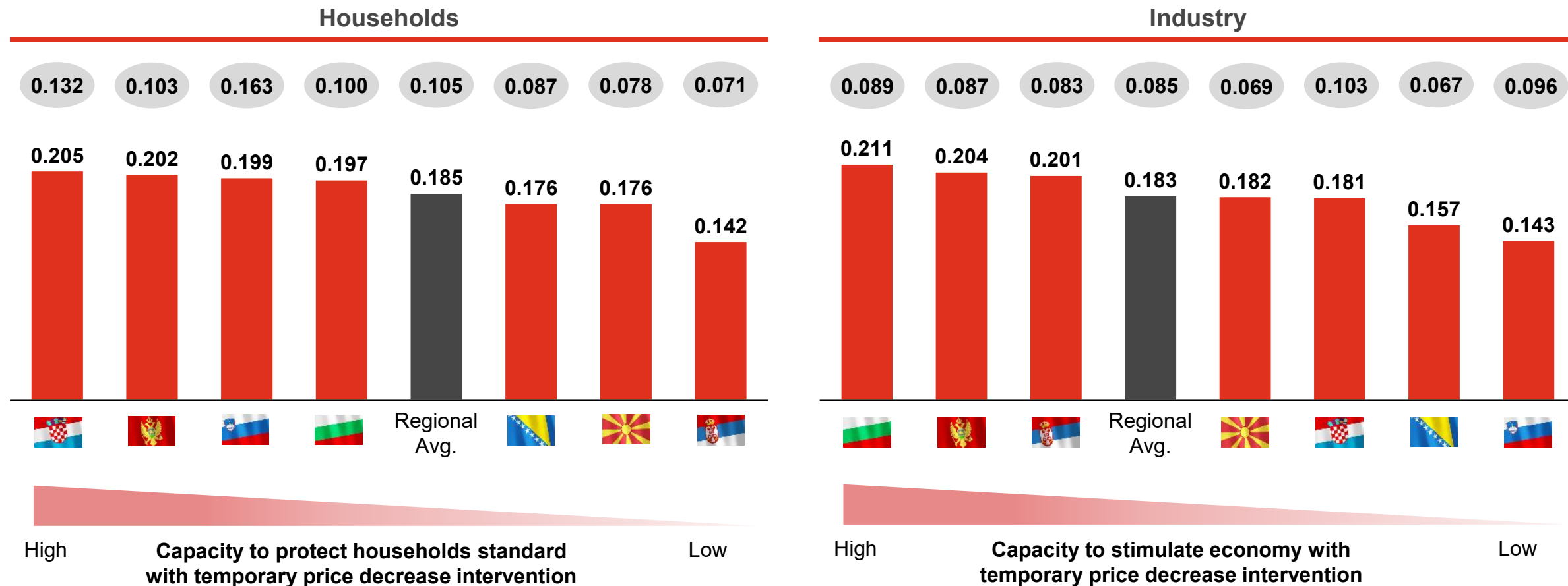
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Serbian, B&H and North Macedonian P&U companies have limited headroom to sustain possible future price interventions

SEE retail electricity prices in 2019 (EUR/kWh and EUR/kWh purchasing power adjusted)



Note: Eurostat definition of electricity prices: Households - annual consumption between 2,500 kWh and 5,000 kWh; Industry - annual consumption between 500 MWh and 2,000 MWh

Source: Eurostat, PwC analysis

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EUR/kWh non-PPP adjusted prices

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Decreasing spot prices present an opportunity for import, while exporters should consider using trading instruments

Impact of price trends on SEE countries

Country	Retail price resilience	Average ¹ share of net import (+) / export (-) in total consumption ¹	Trading strategy	Implications for utilities
 Slovenia		+15.6%	Spot price opportunity	<ul style="list-style-type: none"> In the short-term, trading on the day-ahead market can enable net importers to reduce overall electricity import cost due to current drop in spot price Mid-term perspective shows that price will likely return to pre-crisis level from Q32020 onwards
 Croatia		+19.9%		
 Montenegro		+14.7%		
 North Macedonia		+32.2%		
 Serbia		-1.2%	Hedging	<ul style="list-style-type: none"> Current situation presents a challenge as export at current prices brings lower revenues However, most utilities hedging and future contracts to avoid and/or minimise potential losses
 B&H		-30.1%		
 Bulgaria		-22.2%		
 SEE average		-2.5%		

Low resilience    High resilience

1) Three year average 2016-2018
Source: Eurostat, PwC analysis

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Current period of high price volatility creates disruption, but it is expected that the market will stabilise in H2 2020

Management views from several SEE power utilities

What is your view and how did you respond to cheap electricity prices on power exchange?

"Decrease in electricity spot prices certainly made a positive impact for us where we can book cheaper volumes for the summer period"

"Despite current low wholesale prices, market expectations are still saying that the whole situation with the prices will normalise in the second half of the year"

"We are selling electricity during peak hours and buying at cheaper prices during weekends"

"Our power generation mix cost is still cheap compared to market as we have lots of renewables"

"As we are an export-oriented power utility company, the decline in electricity prices in the wholesale market has led to a significant decrease in revenues from wholesale sales"



SEE utilities have adjusted their operations to COVID-19 safety measures and relatively smoothly overcame supply chain issues

Overview of SEE utilities current response actions (1/2) - as at April 28, 2020



Change in operations

Key trends

- Day-to-day work needed to quickly be adjusted to the COVID-19 situation, causing disruptions in electricity supply
- Part of desk based work is organised from home by using necessary IT systems
- Protection of key O&M personnel (field workers and dispatchers) needed to be ensured through special shift modes

Observation

Regional utilities have successfully adopted to the 'new normal' working mode by going digital and introducing stricter safety measures for field workers



Disruptions in supply chain

- Minor delays in raw materials and components delivery occurred due to suppliers being shut down or not able to ensure full capacity
- Some companies started renegotiation of contracts and exercising of contractual options
- Companies have started considering back-up supplier networks and developing continuity plans

Utilities are successfully facing the supply chain delays through contract renegotiations and back-up options



Companies are now primarily focused on stabilising their liquidity, while major capital projects are continuing with minor delays

Overview of SEE utilities current response actions (2/2) - as at 28 May 2020



Focus on financial stability

Key trends

- Cash collection is currently the top priority of SEE utilities, as they are seeking ways to stabilise liquidity
- Cost scrutiny is also on their agenda where some have already introduced measures such as postponement of non-critical procurement activities and reduction in G&A cost
- For some companies, measures include partial decrease of employee cost/benefits

Observation

▶ **Cash collection is now the main concern where most players have turned to lenders for additional funds. The need to rationalise operating cost strongly correlates to pre-crisis financial stability**



Temporary slowdown in investments

- Large capital projects are not heavily impacted at the moment
- There could be minor delays on some project activities due to lockdown measures and lower mobility
- No major financing risks are expected for utilities, as they are considered a relatively safe asset
- There are no major disruptions in M&A activities for now, but there could be some slowdown in the future

▶ **There are no major drawbacks to continue with large capital projects, but in the upcoming months, delays could be expected to a certain extent**



Companies which have been proactively working on internal efficiency during the 'normal' period are now better prepared

View of SEE power utilities management

How are you dealing with this situation and what are your moves?

"Cash collection is the biggest issue in these times for us, with projections of 15%-25% per month less compared to pre-crisis periods"

"We are actively talking with EBRD and commercial banks for additional funds to stabilise our cash positions. The upside of this situation is relatively low interest rates"

"We don't see significant hurdles for our capital projects – just smaller delays due to travel restrictions for foreign contractors"

"Our stable business performance made us ready to tackle the COVID-19 economic downturn. However, we are closely monitoring the situation and are ready to respond"

"We have quickly adopted our operations in accordance with epidemiological measures"

"There is already a need to rationalise operating cost and we are certain that this will be the case in the near future as well"

"Investment plans will have to undergo certain restrictions due to expected cash inflow shortage"



The EU leaders still aim to continue with the Green Deal agenda as planned, despite non-favourable policies of some countries

Mixed government policies on energy transition in reaction to COVID-19

Non-favourable policies



Fiscal stimulus package of the US has no relief measures for renewables



China is relaxing its environmental supervision of companies



Poland argued to put the European Green Deal aside

Favourable policies



EU leaders have called on EC to include green policies in recovery plan



Canada plans to keep climate change a priority focus for 2020's budget



The UK presented its budget for 2020 with a boost for renewables

Current EU response to COVID-19 reflects energy transition

- The European Commission announced that the COVID-19 emergency **won't affect the timeline of the EU's Green Deal**
- The Commission has launched an online public consultation to **increase the current EU's 2030 climate target** of a 40% cut in greenhouse gas emissions to at least 50%
- The EU leaders called for governments to use the current situation **to step up their climate ambitions and launch sustainable stimulus packages**
- SEE Governments have **not yet announced any changes in state-level climate policy** due to COVID-19 crisis
- SEE countries are likely to **follow the steps recommended by the European Commission and energy community**



PwC point of view is that Governments need to incentivise investments in the renewables and reiterate the focus on sustainability

Government actions to stimulate 'Green Economy'








- 1 Allocate **resources for the renewable energy sector** or **create renewable specific initiatives**, as a part of the economic stimulus deployed globally for COVID-19 crisis
- 2 Enable companies to **build resilience into energy value chain by creating cooperative models** and **drive digitisation initiatives through incentive schemes**
- 3 Incorporate **risks from physical systemic economic shocks** (e.g. climate change, pandemic, natural disasters) into energy infrastructure planning and renewables funding
- 4 **Incentivise renewables investments** to meet 'green' targets and provide **long-term investment stability** via effective subsidy or funding schemes
- 5 **Reiterate global focus on sustainability** and **collaborate on a national and international level** to ensure concerted drive towards greener economy



Additionally, most SEE countries have taken payment relaxation measures to protect customers, similar to their European peers

Overview of measures taken by utilities and/or governments (as at April 28, 2020)

Typical measures by European utilities / governments

	 Slovenia	 Croatia	 Serbia	 B&H	 Montenegro	 North Macedonia	 Bulgaria
Payment deadline extensions and penalty elimination		✓	✓	✓		✓	✓
Special arrangements for elderly and endangered customers			✓		✓		
Moratorium on disconnections due to outstanding payment		✓	✓	✓		✓	✓
Temporary RES and CHP subsidy suspension	✓		✓				
Temporary electricity price discounts from suppliers	✓	✓					
Postponement of planned outages							✓

Source: European Commission, Eurelectric, company websites, media, PwC analysis

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It is possible that Governments introduce new measures as P&Us have a high impact on peoples' socio-economic status

Management views from several SEE power utilities

How did Governments react to new market conditions?

"The Government seized all penalty (default) interest payments on the accrued interest from March to May"

"There are no official responses yet but the measures will probably aim towards protecting vulnerable customers"

"We believe that it is not realistic that the Government will make retail price interventions for households as they are already very low compared to other markets"

"There is always the possibility that the Government decides to lower retail prices to help protect customers"

"There are certain postponements for electricity bill payments in this period as well"

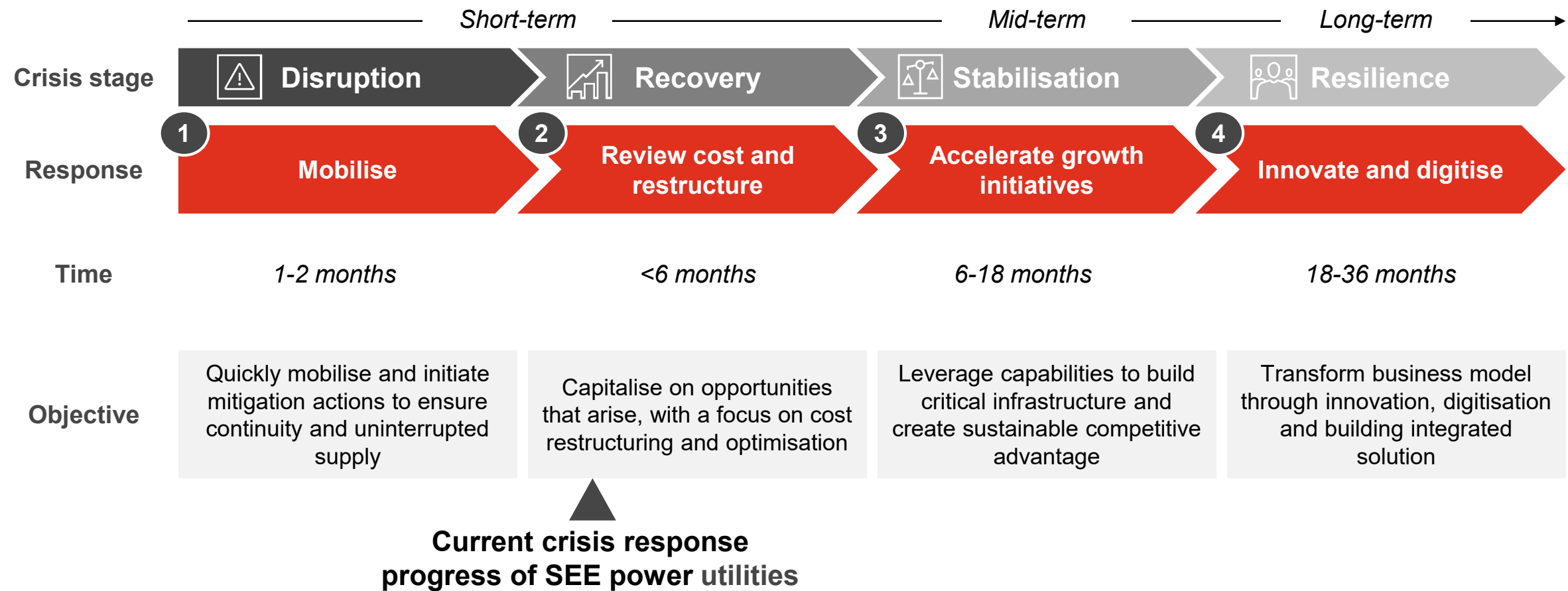
The background of the slide is a dark gray network diagram. It consists of numerous small square nodes, some of which are red and others are white. These nodes are interconnected by a web of thin, light gray lines. A large, white, sans-serif number '4' is positioned on the left side of the slide. To the right of the number, there is a red rectangular box containing white text. The overall aesthetic is modern and technical.

4

Next steps for
P&U companies





As SEE power and utilities are exiting disruption phase, mindset needs to be shifted towards recovery and transformation

Selection of specific response actions for P&U through stages



In the first step, utilities have adjusted their operations to new circumstances in order to ensure contingency and uninterrupted supply

Action steps in mobilisation stage - stabilise

Area	Action steps
 Customers	<ul style="list-style-type: none"> • Protect vulnerable customers • Allow payment flexibility options based on risk profiling • Manage cash collection and customer risk profiling
 Operations and supply chain	<ul style="list-style-type: none"> • Tighten QHSE procedures • Prepare contingency plans for shifts rotations • Adjust outage planning and management • Coordinate and plan critical spare parts in case of supply disruptions
 Asset management	<ul style="list-style-type: none"> • Diversify sourcing per key categories and suppliers in case of supply disruptions • Conduct scenario analysis • Review plans and prepare contingency for large capital projects
 Corporate	<ul style="list-style-type: none"> • Develop a holistic understanding of the business environment • Manage liquidity risk • Assess company's exposure and resilience capabilities

Source: PwC analysis

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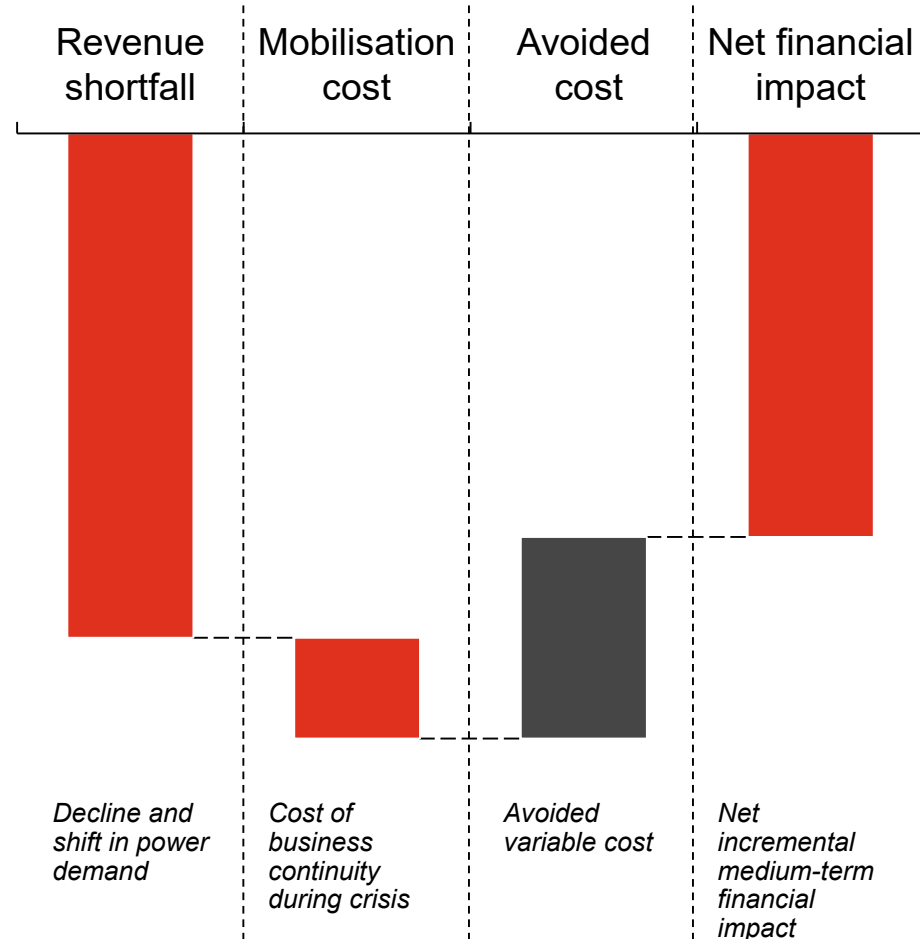
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Tracking financial impact and addressing it through a cost review is a key step in the recovery stage

Illustrative COVID-19 financial impact and mitigation plan for P&U



Source: PwC analysis

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Short term cost review

Zero-basing capabilities

Rationalise project portfolio (i.e. ROI / strategic importance)

Eliminate redundant activities

Defer non-strategic capital expenditures

Adjust service levels to required

Back-office optimisation

Eliminate shadow functions embedded in BUs

Consolidate and centralise activities (to realise scale benefits)

Maintenance strategy

Adjust risk tolerance to regulatory requirements / industry practice

Re-evaluate standards required to maintain current risk levels

Regulatory optimisation

Maximise regulatory parameters in regulatory window

Use regulatory insights to prioritise cost savings

Potential opportunities for investments will depend on the core capabilities of the company and individual strategic priorities

Potential investment and growth strategies

Potential investment strategies

Re-assess conventional power plant portfolio



Increase RES investments



Focus on core networks



Rationale and action steps

- Strong decarbonisation will be in core focus of European 2030 and 2050 policy agenda
- Most coal power plants in SEE are near the end of their lifetime
- Increase of carbon price could be an additional incentive
- Increase investments in gas as a substitute for coal

- Leverage the scale, capabilities and financial position to increase investments on previously highly competitive RES tenders
- Advancement in solar and wind technology has reduced the cost of these sources
- Partner with large industrial players or other infrastructure investments to share risk and cost

- Leverage cheap financing to expand and improve performance of transmission and distribution networks across the region
- Build critical infrastructure to prepare for future network conditions (more distributed and intermittent energy source, prosumers, storage technologies etc.)

Benefits

- **Higher rate of return on capital**
- **Higher efficiency achieved through revitalisation**
- **Potential to repurpose infrastructure, real estate and equipment**
- **Contribution to decarbonisation initiatives**

- **Ability to win tenders at a more competitive price than over past years**
- **Good rate of return on capital**
- **More diversified generation portfolio**
- **Contribution to decarbonisation initiatives**

- **Potential to achieve savings through lowered distribution losses**
- **Improved network performance indices**
- **Timely preparation for future conditions**
- **Contribution to decarbonisation initiatives**

Source: PwC analysis

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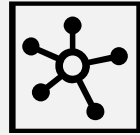
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Some future crisis response could improve doubling down on digitisation of operations and adopting technology innovations

Key areas for digitalisation



Core Operational Processes

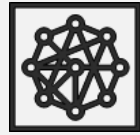


Predictive maintenance

Real-time condition monitoring

Flexibility management

Investments in SCADA



Capacity and Load Management



Dynamic line rating

AI augmented system operation

Congestion mgmt solutions (IoT, sensing)



Digitised Support Processes



Regulatory reporting on shared data platform

Robotic Process Automation (RPA)

Automated client interaction and transparent order fulfilment



Digitally-enabled Innovations







Broader access to markets / crowd balancing

Data hub services and data platforms

Blockchain for Transactive Energy solutions

Utilities now need to focus on managing liquidity and cost, but strategy in the long term must be oriented towards growth and innovation

Summary of specific crisis response actions for P&U

	 Disruption	 Recovery	 Stabilisation	 Resilience
Customers	Protect vulnerable customers and allow payment flexibility options based on risk profiling	Manage cash collection and customer risk profiling	Reduce frequency of physical meter readings and enable faster smart meter roll out Focus on managing commercial losses Enhance customer loyalty and services	
Operations and supply chain	Tighten QHSE procedures and prepare contingency plans for shifts rotations	Digitise points of sales and customer services (payments, web and call centre, etc.)		Automation of plant operations
	Adjust outage planning and management	Coordinate and plan critical spare parts in case of supply disruptions		Investments in SCADA
Asset mgmt.		Diversify sourcing per key categories and suppliers in case of supply disruptions	Conduct scenario analysis, review plans and prepare contingency for large capital projects	Invest in asset management capabilities (technology, tools, and processes) to improve efficiency and ROI
				Optimise maintenance strategy and capabilities toward predictive and risk based maintenance
Corporate	Develop a holistic understanding of the business environment	Manage liquidity risk	Strategic, operational and financial restructuring of the company or a business segment	
	Assess company's exposure and resilience capabilities	Rationalise non-critical cost elements that will not affect core capabilities		

Source: PwC analysis

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Value chain heat map

Generation

Network

Retail

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Contacts

Dejan Ljuština

Partner, PwC Croatia
SEE Energy Consulting Leader
dejan.ljustina@pwc.com

Mislav Slade-Šilović

Director, PwC Croatia
SEE Power and Utilities Leader
mislav.slade@pwc.com

Karlo Jadanić

Manager, PwC Croatia
SEE Energy Consulting Team Member
karlo.jadanic@pwc.com

Ivan Bačeković

Senior Consultant, PwC Croatia
SEE Energy Consulting Team Member
ivan.bacekovic@pwc.com

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