



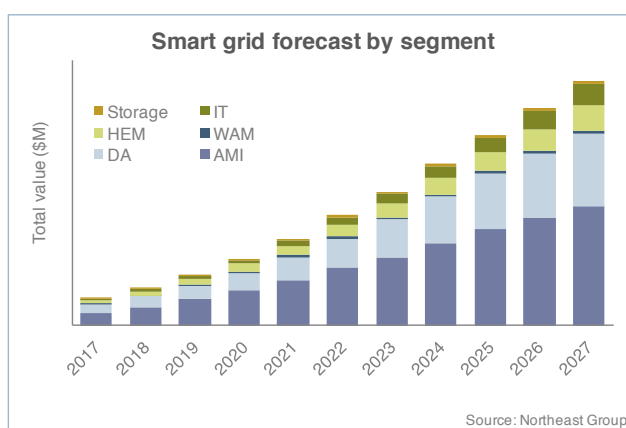
**northeast** group, llc

Central & Eastern Europe and Turkey Smart Grid:  
Market Forecast (2017 – 2027)

September 2017 | [www.northeast-group.com](http://www.northeast-group.com)

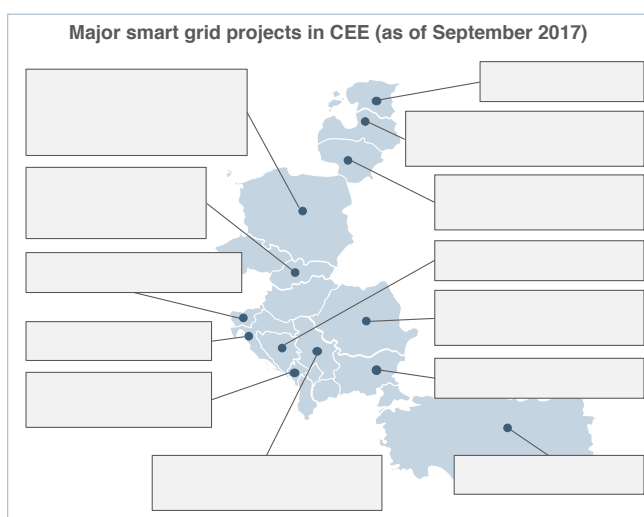
## Central & Eastern Europe and Turkey Smart Grid: Market Forecast (2017-2027)

Countries in the Central & Eastern Europe (CEE) region are leaders for their smart grid and smart metering potential among emerging market nations. By 2027, ten of the 12 key countries in this study (all except for Croatia and Lithuania) will have completed smart meter deployments of at least 80% and many will have deployed other advanced smart grid infrastructure such as distribution



automation, home area networks, distributed renewable sources of generation, and electric vehicle charging infrastructure. Overall, the smart grid market represents \$28.6 billion of investment over the next ten years.

Volume III of this study covers 12 CEE countries in depth, as well as six additional countries. It includes the 11 countries in Central & Eastern Europe that are now part of the European Union but until the early 1990s were Communist states, as well as Turkey, Albania, and the remaining former Yugoslav countries. These countries have all undergone radical industry restructurings over the past two decades, and in some cases are still in the process of full liberalization. In most countries, the state still plays a role in one or more segments of the electricity industry. Overall power infrastructure is in many cases outdated and not compatible with a fully integrated European power market. The CEE electricity market is therefore undergoing changes, which present utilities with opportunities to invest in smart grid infrastructure in the process of upgrading their grids.



Most of these countries must also meet EU regulations, and non-EU countries are following similar guidelines. EU Directive 2009/72/EC requires that all EU states conduct a cost-benefit analysis (CBA) for smart metering and that, if reaching a positive outcome, countries deploy smart meters to 80% of households and businesses by 2020. Most Western European countries have found net positive benefits from smart metering and launched smart metering programs to meet

(or attempt to meet) EU targets. The case is less clear in the CEE region. Many countries have not officially decided, and with just three years to go, most CEE countries are expected to miss the EU target. But the EU is encouraging countries with negative CBAs to re-assess their smart meter potential in the next few years as costs come down and underlying conditions improve. Therefore, it is still likely that most CEE countries will begin large-scale deployments in the next few years.

Beyond regulations, the CEE region's core market conditions support smart meter deployments. Per-capita electricity consumption is higher than in most other emerging markets. Consumption is lower than in Western Europe but is growing faster. Meanwhile, the CEE region has stronger historic and economic ties with Russia, and recent aggressiveness from Russia has increased the importance of energy independence in the region. Finally, T&D losses and power outages are a much larger concern than in Western Europe. In some CEE countries, utilities can justify smart meter deployments through immediate loss reduction benefits, with other benefits serving as an added bonus.

The CEE region also benefits from knowledge spillovers from Western Europe. Many utilities in CEE are owned by French, German, and Italian utilities that already have experience in deploying smart grid infrastructure. Almost all of the major smart grid vendors already have a presence in CEE countries, giving them a better grasp of regulatory conditions. EU-based vendors in particular face few barriers due to the common market. Additionally, many local vendors are already active across the region, which will help drive new market segments.

Most CEE countries have not yet transposed EU smart metering regulations into national law or accepted the EU smart meter mandate. Therefore, some uncertainty still remains in the market. Still, CEE countries have conditions that support smart grid development, willing stakeholders, and well-developed pilot projects—including large-scale rollouts in some cases. The CEE smart grid market is poised for significant near-term growth.

Key questions answered in this study:

- How large will the smart grid market be across CEE and Turkey over the next decade?
- Which CEE countries are expected to comply with EU smart grid requirements?
- Which CEE countries are investing in more advanced smart grid segments like DA, WAM, IT and battery storage?
- What major international and local vendors are best positioned to supply the CEE market?

## Table of Contents

i. Executive summary	1
<b>1. What's new in 2017</b>	<b>6</b>
<b>2. Central and Eastern Europe smart grid snapshot</b>	<b>16</b>
2.1 The region in comparison	18
2.2 Regional drivers	20
2.3 Regional challenges	28
<b>3. Regional market forecast</b>	<b>33</b>
<b>4. Poland</b>	<b>42</b>
4.1 Electricity industry structure	44
4.2 Smart grid regulatory environment	46
4.3 Market forecast	50
4.4 Utility activity	53
<b>5. Romania</b>	<b>59</b>
5.1 Electricity industry structure	61
5.2 Smart grid regulatory environment	62
5.3 Market forecast	65
5.4 Utility activity	68
<b>6. Turkey</b>	<b>72</b>
6.1 Electricity industry structure	74
6.2 Smart grid regulatory environment	76
6.3 Market forecast	80
6.4 Utility activity	82
<b>7. Estonia</b>	<b>86</b>
7.1 Electricity industry structure	88
7.2 Smart grid regulatory environment	90
7.3 Market forecast	93
7.4 Utility activity	95
<b>8. Slovenia</b>	<b>97</b>
8.1 Electricity industry structure	99
8.2 Smart grid regulatory environment	100

## Table of Contents (cont.)

8.3 Market forecast	102
8.4 Utility activity	105
<b>9. Hungary</b>	<b>108</b>
9.1 Electricity industry structure	110
9.2 Smart grid regulatory environment	111
9.3 Market forecast	113
9.4 Utility activity	116
<b>10. Bulgaria</b>	<b>118</b>
10.1 Electricity industry structure	120
10.2 Smart grid regulatory environment	121
10.3 Market forecast	123
10.4 Utility activity	125
<b>11. Czech Republic</b>	<b>128</b>
11.1 Electricity industry structure	130
11.2 Smart grid regulatory environment	131
11.3 Market forecast	133
11.4 Utility activity	136
<b>12. Slovakia</b>	<b>138</b>
12.1 Electricity industry structure	140
12.2 Smart grid regulatory environment	141
12.3 Market forecast	144
12.4 Utility activity	146
<b>13. Latvia</b>	<b>148</b>
13.1 Electricity industry structure	150
13.2 Smart grid regulatory environment	151
13.3 Market forecast	152
13.4 Utility activity	155
<b>14. Croatia</b>	<b>158</b>
14.1 Electricity industry structure	160
14.2 Smart grid regulatory environment	161

## Table of Contents (cont.)

14.3 Market forecast	163
14.4 Utility activity	165
<b>15. Lithuania</b>	<b>167</b>
15.1 Electricity industry structure	169
15.2 Smart grid regulatory environment	170
15.3 Market forecast	172
15.4 Utility activity	175
<b>16. The rest of the region</b>	<b>177</b>
16.1 Serbia	178
16.2 Montenegro	182
16.3 Macedonia	183
16.4 Albania	183
16.5 Bosnia and Herzegovina	184
16.6 Kosovo	185
<b>17. Vendor activity</b>	<b>186</b>
17.1 Domestic vendors	186
17.2 International vendors active in smart grid in CEE & Turkey	196
<b>18. Appendix</b>	<b>205</b>
18.1 Methodology	205
18.2 Smart grid overview	209
18.3 Global smart grid activity	223
18.4 Renewable energy incentives	226
18.5 List of companies covered in this report	242
18.6 List of acronyms	246

## List of Figures, Boxes, and Tables

Central & Eastern Europe smart grid: key takeaways	2
AMI deployments at top CEE distribution utilities	5
AMI deployments at Turkish distribution utilities	5
Figure 1.1 Changes in smart meter potential in CEE 2015 to 2017	7
Table 1.1: Regulatory shifts in CEE countries	8
Figure 1.2: Deployment progress in four CEE countries	8
Figure 1.3: Smart metering progress by Slovenian utilities	9
Table 1.2: Smart grid activity in CEE (as of September 2017)	10
Figure 1.4: Czech Smart Grid National Action Plan	11
Figure 1.5: Major smart grid projects in CEE (as of September 2017)	12
Table 1.3: Funding for smart grid projects in CEE region	13
Figure 1.6: Low power wide area network (LPWAN) projects in CEE	14
Figure 2.1 Emerging markets smart meter potential	16
Figure 2.2: Per-capita electricity consumption	18
Figure 2.3: Per-capita CO <sub>2</sub> emissions	19
Figure 2.4: Projected GDP growth (2017 – 2021)	20
Box 2.1: EU Directive 2009/72/EC	21
Figure 2.5: CEE compliance with EU smart meter mandates	22
Table 2.1: European Commission recommendations for smart meter requirements	23
Table 2.2: EV public charging point targets in EU CEE countries for 2020	24
Figure 2.6: Electricity prices in emerging markets	24
Figure 2.7: Electricity prices in Europe	25
Table 2.3: 20-20-20 targets for CEE countries	26
Figure 2.8: Renewable sources of energy in CEE	27
Figure 2.9: Renewable energy promotion instruments in CEE	27
Figure 2.10: T&D losses in CEE	28
Table 2.4: Smart grid market drivers and barriers in CEE	28
Figure 2.11: Average annual GDP growth in CEE	30
Figure 2.12: Per-capita electricity consumption in CEE	31
Figure 2.13: Status of planned smart meter rollouts in CEE	32
Figure 3.1: CEE AMI penetration rate	33
Figure 3.2: CEE cumulative smart grid forecast by country	34
Table 3.1: CEE cumulative smart grid forecast data by country	34

## List of Figures, Boxes, and Tables (cont.)

Figure 3.3: CEE cumulative smart grid forecast	35
Table 3.2: CEE cumulative smart grid forecast data	35
Figure 3.4: Annual AMI deployments in CEE	36
Figure 3.5: AMI cost breakdown	37
Figure 3.6: Per-endpoint smart meter cost estimates	37
Figure 3.7: AMI forecast by segment	38
Table 3.3: AMI forecast data by segment	38
Figure 3.8: DA forecast by segment	39
Table 3.4: DA forecast data by segment	39
Figure 3.9: HEM forecast by segment	40
Table 3.5: HEM forecast data by segment	40
Figure 3.10: IT forecast by segment	41
Table 3.6: IT forecast data by segment	41
Table 4.1: Poland key data	42
Figure 4.1: Poland AMI penetration rate	42
Table 4.2: Smart grid indicators in Poland	43
Figure 4.2: New and decommissioned generation in Poland	44
Table 4.3: Poland's smart grid roadmap	47
Box 4.1: Political risk in Poland	48
Figure 4.3: Poland smart grid forecast	51
Table 4.4: Poland smart grid forecast data	51
Figure 4.4: Poland AMI forecast	52
Table 4.5: Poland AMI forecast data	52
Table 4.6: Landis+Gyr Smart Grid Terminal (SGT) shipments	53
Table 4.7: Confirmed smart meter deployments in Polish utilities	54
Table 4.8: Latest smart grid projects in Poland	55
Table 4.9: Additional smart grid projects in Poland	58
Table 5.1: Romania key data	59
Figure 5.1: Romania AMI penetration rate	59
Table 5.2: Smart grid indicators in Romania	60
Box 5.1: Political risk in Romania	63
Table 5.3: Romania's expected smart meter deployment investments	64
Figure 5.2: CAIDI in select CEE countries	65
Figure 5.3: Romania smart grid forecast	66



## List of Figures, Boxes, and Tables (cont.)

Table 5.4: Romania smart grid forecast data	66
Figure 5.4: Romania AMI forecast	67
Table 5.5: Romania AMI forecast data	67
Figure 5.5: Enel AMI deployments in Romania	68
Figure 5.6: Recent and upcoming Romania smart grid projects	70
Table 5.6: Additional smart grid projects in Romania	71
Table 6.1: Turkey key data	72
Figure 6.1: Turkey AMI penetration rate	72
Table 6.2: Smart grid indicators in Turkey	73
Table 6.3: Distribution utilities in Turkey	75
Figure 6.2: AMI deployments at Turkish distribution utilities	76
Figure 6.3: Amendments to Turkish Distribution System Revenues	77
Box 6.1: Political risk in Turkey	78
Figure 6.4: Turkey smart grid forecast	80
Table 6.4: Turkey smart grid forecast data	80
Figure 6.5: Turkey AMI forecast	81
Table 6.5: Turkey AMI forecast data	81
Figure 6.6: Smart grid activity in Turkey	83
Table 6.6: AMI installments by distribution utilities in Turkey	84
Table 7.1: Estonia key data	86
Figure 7.1: Estonia AMI penetration rate	86
Table 7.2: Smart grid indicators in Estonia	87
Box 7.1: Political risk in Estonia	89
Figure 7.2: Estonia's E-Mobility operating model	92
Figure 7.3: Estonia smart grid forecast	93
Table 7.3: Estonia smart grid forecast data	93
Figure 7.4: Estonia AMI forecast	94
Table 7.4: Estonia AMI forecast data	94
Table 7.5: Additional smart grid projects in Estonia	96
Table 8.1: Slovenia key data	97
Figure 8.1: Slovenia AMI penetration rate	97
Table 8.2: Smart grid indicators in Slovenia	98
Box 8.1: Political risk in Slovenia	101
Figure 8.2: Estimated monthly household power bills in CEE	102

## List of Figures, Boxes, and Tables (cont.)

Figure 8.3: Slovenia smart grid forecast	103
Table 8.3: Slovenia smart grid forecast data	103
Figure 8.4: Slovenia AMI forecast	104
Table 8.4: Slovenia AMI forecast data	104
Figure 8.5: Smart metering progress by Slovenian utilities	106
Table 8.5: Smart grid priorities in Slovenia	107
Table 8.6: Additional smart grid projects in Slovenia	107
Table 9.1: Hungary key data	108
Figure 9.1: Hungary AMI penetration rate	108
Table 9.2: Smart grid indicators in Hungary	109
Box 9.1: Political risk in Hungary	111
Figure 9.2: Hungary smart meter regulatory progress	112
Figure 9.3: Public support for smart metering in Hungary (2013)	113
Figure 9.4: Hungary smart grid forecast	114
Table 9.3: Hungary smart grid forecast data	114
Figure 9.5: Hungary AMI forecast	115
Table 9.4: Hungary AMI forecast data	115
Table 9.5: Additional smart grid projects in Hungary	117
Table 10.1: Bulgaria key data	118
Figure 10.1: Bulgaria AMI penetration rate	118
Table 10.2: Smart grid indicators in Bulgaria	119
Box 10.1: Political risk in Bulgaria	121
Table 10.3: Ease of business rankings	123
Figure 10.2: Bulgaria smart grid forecast	124
Table 10.4: Bulgaria smart grid forecast data	124
Figure 10.3: Bulgaria AMI forecast	125
Table 10.5: Bulgaria AMI forecast data	125
Figure 10.4: Bulgaria smart grid activity	126
Table 10.6: Additional smart grid projects in Bulgaria	127
Table 11.1: Czech Republic key data	128
Figure 11.1: Czech Republic AMI penetration rate	128
Table 11.2: Smart grid indicators in Czech Republic	129
Box 11.1: Political risk in Czech Republic	131
Figure 11.2: Czech Smart Grid National Action Plan	132

## List of Figures, Boxes, and Tables (cont.)

Figure 11.3: Planned renewable energy development in Czech Republic	133
Figure 11.4: Czech Republic smart grid forecast	134
Table 11.3: Czech Republic smart grid forecast data	134
Figure 11.5: Czech Republic AMI forecast	135
Table 11.4: Czech Republic AMI forecast data	135
Table 11.5: Other CEZ smart grid pilot programs	136
Table 11.6: Additional smart grid projects in Czech Republic	137
Table 12.1: Slovakia key data	138
Figure 12.1: Slovakia AMI penetration rate	138
Table 12.2: Smart grid indicators in Slovakia	139
Box 12.1: Political risk in Slovakia	142
Figure 12.2: Slovakia smart grid forecast	144
Table 12.3: Slovakia smart grid forecast data	144
Figure 12.3: Slovakia AMI forecast	145
Table 12.4: Slovakia AMI forecast data	145
Table 12.5: Additional smart grid projects in Slovakia	147
Table 13.1: Latvia key data	148
Figure 13.1: Latvia AMI penetration rate	148
Table 13.2: Smart grid indicators in Latvia	149
Box 13.1: Political risk in Latvia	151
Figure 13.2: Latvia smart grid forecast	153
Table 13.3: Latvia smart grid forecast data	153
Figure 13.3: Latvia AMI forecast	154
Table 13.4: Latvia AMI forecast data	154
Figure 13.4: Sadales Tikls deployment schedule	156
Table 13.5: Additional smart grid projects in Latvia	157
Table 14.1: Croatia key data	158
Figure 14.1: Croatia AMI penetration rate	158
Table 14.2: Smart grid indicators in Croatia	159
Box 14.1: Political risk in Croatia	161
Figure 14.2: Croatia smart grid forecast	163
Table 14.3: Croatia smart grid forecast data	163
Figure 14.3: Croatia AMI forecast	164
Table 14.4: Croatia AMI forecast data	164

## List of Figures, Boxes, and Tables (cont.)

Table 14.5: Additional smart grid projects in Croatia	166
Table 15.1: Lithuania key data	167
Figure 15.1: Lithuania AMI penetration rate	167
Table 15.2: Smart grid indicators in Lithuania	168
Box 15.1: Political risk in Lithuania	170
Figure 15.2: Lithuania smart grid regulatory development	171
Table 15.3: Lithuania smart grid forecast data	173
Figure 15.3: Lithuania smart grid forecast	173
Table 15.4: Lithuania AMI forecast data	174
Figure 15.4: Lithuania AMI forecast	174
Table 15.5: Additional smart grid projects in Lithuania	176
Table 16.1: Key data for other CEE countries	177
Table 16.2: EBRD smart grid loans to former Yugoslav countries	178
Figure 16.1: Other CEE smart grid forecast	179
Table 16.3: Other CEE smart grid forecast data	179
Figure 16.2: Other CEE AMI forecast	180
Table 16.4: Other CEE AMI forecast data	180
Figure 16.3: Smart grid projects in the rest of the CEE region	181
Table 16.5 : Key Smart grid projects in other countries	182
Table 16.6 : Additional smart grid projects in other countries	185
Figure 17.1: Leading smart grid vendors in CEE	186
Table 17.1: Other leading smart grid vendors in CEE	195
Figure 18.1: Smart grid value chain	209
Figure 18.2: Smart grid model highlighting focus in CEE	210
Table 18.1: Benefits of AMI in CEE	213
Table 18.2: Electric vehicle subsidies in CEE	215
Table 18.3: Demand response options	216
Figure 18.3: Transmission interconnections in CEE	221
Figure 18.4: Global smart grid activity	223
Figure 18.5: Cumulative smart grid investment from 2017 – 2027 by region (\$m)	224
Figure 18.6: Annual smart grid and AMI investment by region in 2027	224
Table 18.4: Global smart grid drivers and activity	225
Figure 18.7: Solar and wind installed capacity in CEE (2015)	226

## List of Figures, Boxes, and Tables (cont.)

Table 18.5: Wind and solar feed-in tariffs and premiums in CEE	227
Table 18.6: Electric vehicle data in Central & Eastern Europe	229
Table 18.7: Cost comparison in Hungary, Romania, and Slovakia CBAs	230
Table 18.8: Examples of quantifying smart meter benefits in Slovakia	230
Table 18.9: Sensitivity analysis for smart metering cost-benefit analyses	230
Table 18.10: NPV in Hungary, Romania, and Slovakia	230

## Order Form – Central & Eastern Europe and Turkey Smart Grid: Market Forecast (2017-2027)

### Pricing

Single user – \$3,750 | Enterprise license – \$5,400

*Clients purchasing a single user license are limited to one user for this report. The enterprise license allows all employees within a single organization to view the report. Any forwarding or sharing of the report to others who have not paid for it is strictly forbidden.*

**Email orders:** Fill out and scan the sheet below. Please email orders to **ben.gardner@northeast-group.com**

**Telephone:** We can be reached at **+1.202.538.0848**. Please have all of the information below ready to expedite your order.

### Customer information

SINGLE USER     ENTERPRISE LICENSE

NAME	POSITION	COMPANY	
ADDRESS			
CITY	STATE	POSTAL CODE	COUNTRY
TELEPHONE	EMAIL		

### Credit card information Card type:

VISA   
 MASTERCARD   
 AMERICAN EXPRESS   
 DISCOVER

CARD NUMBER CV CODE	EXPIRATION DATE		
CARDHOLDER'S NAME	SIGNATURE	DATE	
BILLING ADDRESS			
CITY	STATE	POSTAL CODE	COUNTRY

*By purchasing this report I agree to abide by the following terms and conditions: 1. Single-user license - use of this report is restricted to one individual. 2. Enterprise license – use of this report is restricted to individuals within a single enterprise or organization. I agree not to forward or share this report to others who have not paid for its use.*