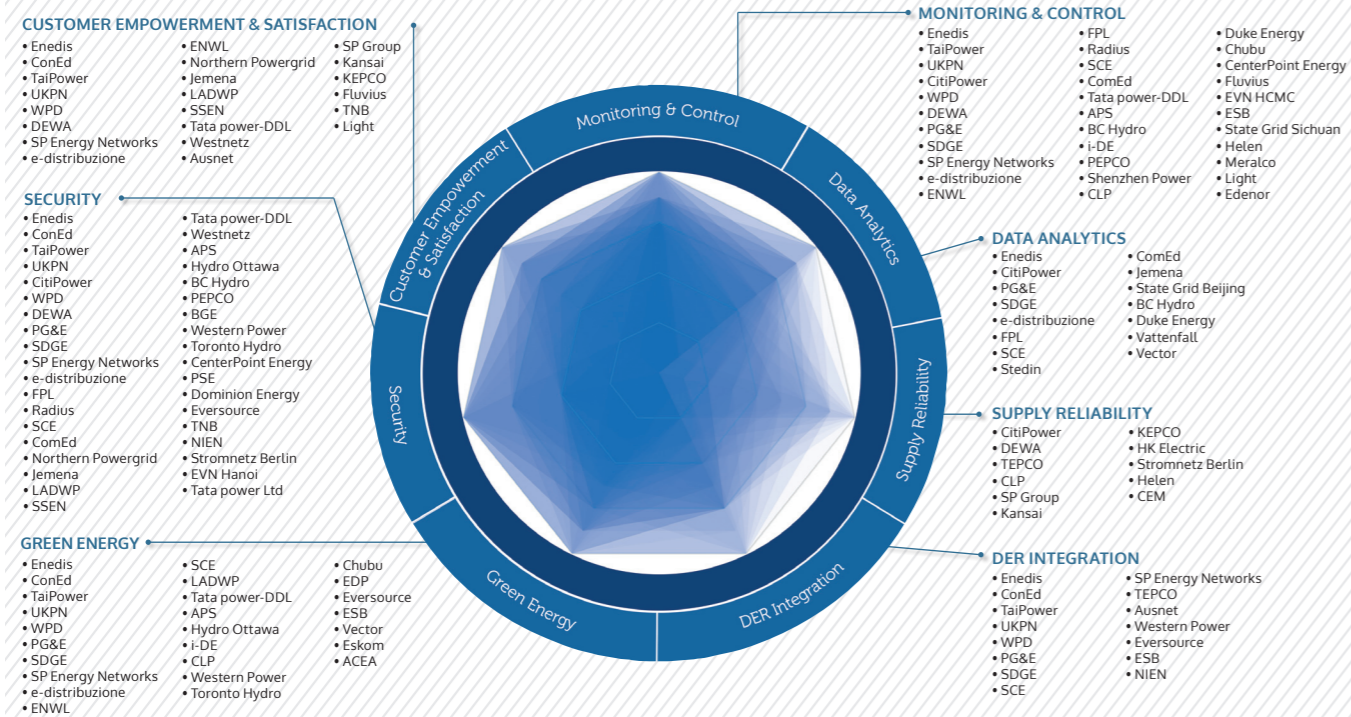


BEST PRACTICES BY DIMENSIONS

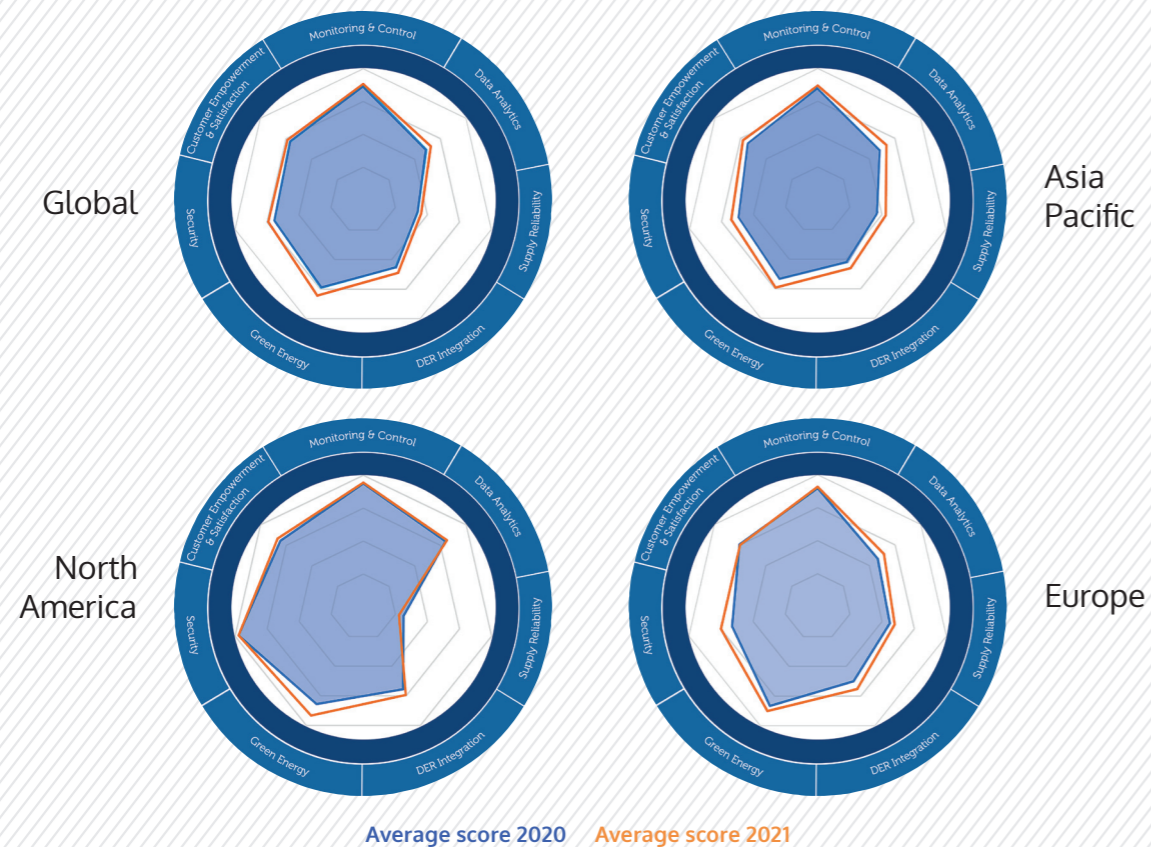


Smarter and Greener Grid

SGI Benchmarking Results 2021



SMART GRID PROGRESS (2020-2021)



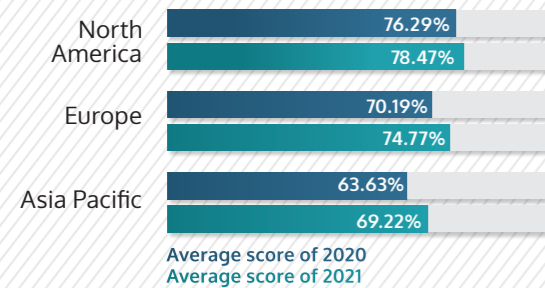
KEY FINDINGS

UTILITIES
are focusing on
Green Energy

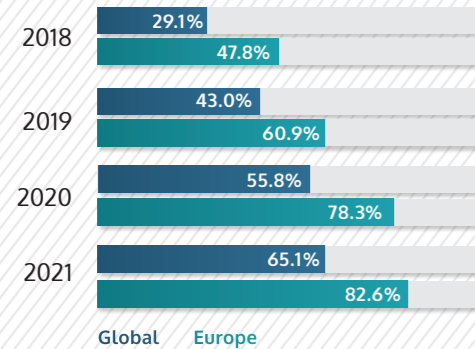
EUROPE
is leading in RE
penetration

ASIA PACIFIC
is catching up on
EV initiatives

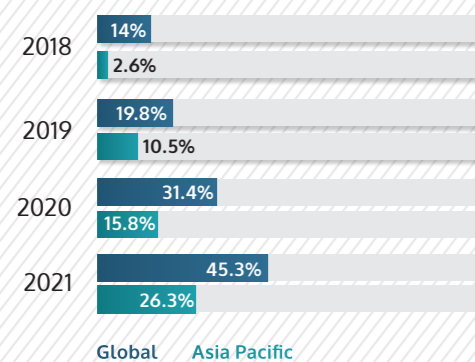
AVERAGE SCORE BY REGION (2021 & 2020)



UTILITIES' SOLAR AND WIND CONTRIBUTING MORE THAN 10% OF SYSTEM DEMAND



ASIA PACIFIC UTILITIES' EV INITIATIVES RELATIVE TO THE WORLD



SMART GRID INDEX

The Smart Grid Index (SGI) measures the smartness of electricity grids globally, in seven key dimensions. The benchmarking also identifies best practices to build smarter grids that deliver better value to customers.

7 DIMENSIONS OF A SMART GRID

- MONITORING & CONTROL**
 - SCADA
 - DMS/ADMS
- DATA ANALYTICS**
 - Smart Meter Coverage
 - Data Analytics Application
- SUPPLY RELIABILITY**
 - SAIDI
 - SAIFI
- DER INTEGRATION**
 - Management of DER Integration
 - Grid Scale Energy Storage
- GREEN ENERGY**
 - Renewable Energy Penetration
 - EV Facilitation
- SECURITY**
 - IT Cyber Security
 - OT Cyber Security
- CUSTOMER EMPOWERMENT & SATISFACTION**
 - Real-Time Data to Customers
 - Customer Satisfaction Feedback

BENCHMARKING RESULTS 2021

| Utility | Country/Market | Score | +/- | Best Practices | Utility | Country/Market | Score | +/- | Best Practices |
|---------------------|----------------|-------|-------|----------------|----------------------|----------------|-------|-------|----------------|
| Enedis | FRA | 96.4 | 17.9% | 🏆🏆🏆🏆🏆🏆🏆 | Chubu | JPN | 71.4 | 3.6% | 🏆🏆 |
| ConEd | USA | 94.6 | 5.4% | 🏆🏆🏆🏆🏆 | State Grid Chongqing | CHN | 71.4 | 7.1% | 🏆🏆 |
| TaiPower | TWN | 94.6 | 12.5% | 🏆🏆🏆🏆🏆 | CenterPoint Energy | USA | 69.6 | -5.4% | 🏆🏆 |
| UKPN | GBR | 94.6 | 0.0% | 🏆🏆🏆🏆🏆 | Fluvius | BEL | 69.6 | 1.8% | 🏆🏆 |
| CitiPower | AUS | 92.9 | 5.4% | 🏆🏆🏆🏆🏆 | Liander | NLD | 69.6 | 3.6% | 🏆 |
| WPD | GBR | 92.9 | 1.8% | 🏆🏆🏆🏆🏆 | PSE | USA | 69.6 | 1.8% | 🏆 |
| DEWA | ARE | 89.3 | 10.7% | 🏆🏆🏆🏆 | Dominion Energy | USA | 67.9 | 5.4% | 🏆 |
| PG&E | USA | 87.5 | -5.4% | 🏆🏆🏆🏆🏆 | EDP | PRT | 67.9 | -1.8% | 🏆 |
| SDGE | USA | 87.5 | 0.0% | 🏆🏆🏆🏆🏆 | Eversource | USA | 67.9 | -1.8% | 🏆🏆🏆 |
| SP Energy Networks | GBR | 87.5 | 3.6% | 🏆🏆🏆🏆🏆 | EVN HCMC | VNM | 67.9 | 16.1% | 🏆 |
| e-distribuzione | ITA | 85.7 | 1.8% | 🏆🏆🏆🏆🏆 | MEA | THA | 67.9 | 14.3% | 🏆 |
| ENWL | GBR | 85.7 | 7.1% | 🏆🏆🏆🏆 | TNB | MYS | 67.9 | 5.4% | 🏆🏆 |
| FPL | USA | 85.7 | 7.1% | 🏆🏆🏆🏆 | Vattenfall | SWE | 67.9 | 1.8% | 🏆 |
| Radius | DNK | 85.7 | 23.2% | 🏆🏆 | ESB | IRL | 66.1 | 8.9% | 🏆🏆🏆 |
| SCE | USA | 85.7 | 0.0% | 🏆🏆🏆🏆🏆 | State Grid Sichuan | CHN | 66.1 | 3.6% | 🏆 |
| Stedin | NLD | 85.7 | 5.4% | 🏆 | EVN CPC | VNM | 64.3 | 8.9% | 🏆 |
| ComEd | USA | 83.9 | 3.6% | 🏆🏆🏆🏆 | NIEN | GBR | 64.3 | 8.9% | 🏆🏆 |
| Northern Powergrid | GBR | 83.9 | 1.8% | 🏆🏆🏆 | HK Electric | HKG | 62.5 | 1.8% | 🏆 |
| TEPCO | JPN | 82.1 | 7.1% | 🏆🏆🏆 | Kahramaa | QAT | 62.5 | 10.7% | 🏆 |
| Jemena | AUS | 80.4 | 8.9% | 🏆🏆🏆 | State Grid Hubei | CHN | 62.5 | 1.8% | 🏆 |
| LADWP | USA | 80.4 | 1.8% | 🏆🏆🏆 | State Grid Nanjing | CHN | 62.5 | 0.0% | 🏆 |
| SSEN | GBR | 80.4 | 3.6% | 🏆🏆🏆 | State Grid Tianjin | CHN | 62.5 | 0.0% | 🏆 |
| State Grid Beijing | CHN | 80.4 | 7.1% | 🏆 | Stromnetz Berlin | DEU | 62.5 | 10.7% | 🏆🏆 |
| Tata power-DDL | IND | 80.4 | 5.4% | 🏆🏆🏆🏆 | EVN Hanoi | VNM | 60.7 | 5.4% | 🏆 |
| Westnetz | DEU | 80.4 | 0.0% | 🏆🏆🏆 | Helen | FIN | 60.7 | 0.0% | 🏆🏆 |
| APS | USA | 78.6 | 1.8% | 🏆🏆🏆 | Vector | NZL | 60.7 | 3.6% | 🏆🏆 |
| Ausnet | AUS | 78.6 | 5.4% | 🏆🏆🏆 | Meralco | PHL | 58.9 | 0.0% | 🏆 |
| Hydro Ottawa | CAN | 78.6 | 3.6% | 🏆🏆🏆 | PEA | THA | 58.9 | 5.4% | 🏆 |
| BC Hydro | CAN | 76.8 | 7.1% | 🏆🏆🏆 | State Grid Changsha | CHN | 58.9 | 10.7% | 🏆 |
| i-DE | ESP | 76.8 | 1.8% | 🏆🏆🏆 | Eskom | ZAF | 55.4 | 5.4% | 🏆 |
| PEPCO | USA | 76.8 | 1.8% | 🏆🏆🏆 | Wiener Netze | AUT | 55.4 | 3.6% | 🏆 |
| Shenzhen Power | CHN | 76.8 | 3.6% | 🏆 | ACEA | ITA | 51.8 | 0.0% | 🏆 |
| BGE | USA | 75.0 | 1.8% | 🏆 | CEM | MAC | 51.8 | 0.0% | 🏆 |
| CLP | HKG | 75.0 | 0.0% | 🏆🏆🏆 | Tata power Ltd | IND | 51.8 | 3.6% | 🏆 |
| Guangzhou Power | CHN | 75.0 | 5.4% | 🏆 | Light | BRA | 48.2 | 0.0% | 🏆🏆 |
| SP Group | SGP | 75.0 | 0.0% | 🏆🏆 | Rosseti | RUS | 48.2 | 0.0% | 🏆 |
| State Grid Shanghai | CHN | 75.0 | 1.8% | 🏆 | Sarawak Energy | MYS | 46.4 | 8.9% | 🏆 |
| Western Power | AUS | 75.0 | 12.5% | 🏆🏆🏆 | Edenor | ARG | 44.6 | 7.1% | 🏆 |
| Duke Energy | USA | 73.2 | 8.9% | 🏆🏆 | PLN | IDN | 44.6 | 0.0% | 🏆 |
| Kansai | JPN | 73.2 | 14.3% | 🏆🏆 | Enel Dist Sao Paulo | BRA | 37.5 | 0.0% | 🏆 |
| KEPCO | KOR | 73.2 | 0.0% | 🏆🏆 | Enel Dist Chile | CHL | 35.7 | 0.0% | 🏆 |
| Toronto Hydro | CAN | 73.2 | 1.8% | 🏆🏆 | Edesur | ARG | 32.1 | 1.8% | 🏆 |
| Ausgrid | AUS | 71.4 | 1.8% | 🏆 | City Power | ZAF | 21.4 | 0.0% | 🏆 |

Disclaimer:

We have arrived at the findings, opinions and conclusion set out in this paper based on application of our methodology to materials and information we believe to be accurate and reliable, and which are made available in the public domain at the time we carried out the relevant research and study. Despite our best efforts, the materials and information may include inaccuracies and errors. The findings, opinions and conclusion will be construed solely as statements of opinion on the matters addressed in this paper including the degree of grid smartness ratings and shall not in any way represent authoritative assessment or judgment on any such matters. You assume the sole risk of making use of and/or relying on the findings, opinions and conclusion made available in this paper. To the extent permitted by law, we disclaim liability to any person or entity for all and any liability, direct and indirect, special, consequential, incidental losses and damages whatsoever arising from or in connection with your access to or use of the findings, opinions and conclusions in this paper.