## CPC Cooperative Patent Classification

### Y General Tagging of New Technological Developments; General Tagging of Cross-Sectional Technologies Spanning over Several Sections of the IPC; Technical Subjects Covered by Former USPC Cross-Reference Art Collections [XRACs] and Digests

(NOTES omitted)

### Y04 Information or Communication Technologies Having an Impact on Other Technology Areas

### Y04S Systems Integrating Technologies Related to Power Network Operation, Communication or Information Technologies for Improving the Electrical Power Generation, Transmission, Distribution, Management or Usage, i.e. Smart Grids

#### Systems supporting electrical power generation, transmission or distribution

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/00</td>
<td>Systems supporting electrical power generation, transmission or distribution</td>
</tr>
<tr>
<td>10/10</td>
<td>Systems characterised by the monitored, controlled or operated power network elements or equipment</td>
</tr>
<tr>
<td>10/12</td>
<td>the elements or equipment being or involving energy generation units, including distributed generation (DER) or load-side generation</td>
</tr>
<tr>
<td>10/123</td>
<td>the energy generation units being or involving renewable energy sources</td>
</tr>
<tr>
<td>10/126</td>
<td>the energy generation units being or involving electric vehicles [EV] or hybrid vehicles [HEV], i.e. power aggregation of EV or HEV, vehicle to grid arrangements [V2G] (remote or cooperative charging Y04S 30/12: details associated with the interoperability in the section of transportation, e.g. vehicle recognition, authentication, identification or billing Y04S 30/14)</td>
</tr>
<tr>
<td>10/14</td>
<td>the elements or equipments being or involving energy storage units (for systems comprising uninterruptible power supplies or standby generators Y04S 20/12)</td>
</tr>
<tr>
<td>10/16</td>
<td>the elements or equipments being or involving electric power substations</td>
</tr>
<tr>
<td>10/18</td>
<td>the elements or equipments being or involving switches, relays or circuit breakers, e.g. intelligent electronic devices [IED]</td>
</tr>
<tr>
<td>10/20</td>
<td>the elements or equipments being or involving protection elements, arrangements or systems</td>
</tr>
<tr>
<td>10/22</td>
<td>the element or elements being flexible AC transmission systems [FACTS] or power factor or reactive power compensating or correcting units</td>
</tr>
<tr>
<td>10/24</td>
<td>the elements or equipments being or involving voltage regulating units</td>
</tr>
<tr>
<td>10/26</td>
<td>the elements or equipments being or involving measuring units</td>
</tr>
<tr>
<td>10/265</td>
<td>the measuring units being or involving phasor measuring units [PMU]</td>
</tr>
<tr>
<td>10/30</td>
<td>Systems characterised by state monitoring, e.g. fault, temperature monitoring, insulator monitoring, corona discharge</td>
</tr>
</tbody>
</table>

### Systems supporting the management or operation of end-user stationary applications, including also the last stages of power distribution and the control, monitoring or operating management systems at local level

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/00</td>
<td>Systems supporting the management or operation of end-user stationary applications, including also the last stages of power distribution and the control, monitoring or operating management systems at local level (the energy generation units being or involving electricity based vehicles Y04S 10/126; remote or cooperative charging of electric or hybrid vehicles Y04S 30/12)</td>
</tr>
<tr>
<td>20/10</td>
<td>System characterised by the monitored, controlled or operated end-user elements or equipments</td>
</tr>
<tr>
<td>20/12</td>
<td>the elements or equipments being or involving energy storage units, uninterruptible power supply [UPS] systems or standby or emergency generators involved in the last power distribution stages</td>
</tr>
</tbody>
</table>
Systems supporting the management or operation of end-user stationary applications, including also the
last stages...

20/14 . . . The elements or equipments being or involving protection elements, switches, relays or circuit
breakers
20/16 . . . The elements or equipments being or involving power plugs, sockets, adapters or power strips
20/18 . . . The element or elements being a direct current power network, grid or distribution line
20/20 . . . End-user application control systems
20/22 . . . characterised by the aim of the control
20/221 . . . General power management systems
20/222 . . . Demand response systems, e.g. load shedding, peak shaving
20/224 . . . . Curtailment; Interruptions; Retail price-responsive demand
20/225 . . . The system entering an energy saving mode, i.e. sleep, low-power or standby modes
20/227 . . . Domotics or building automation systems
20/228 . . . . Characterised by involving a home automation communication network
20/24 . . . characterised by the end-user application
20/242 . . . the end-user application being or involving home appliances
20/244 . . . . the home appliances being or involving heating ventilating and air conditioning [HVAC] units
20/246 . . . . the system involving the remote operation of lamps or lighting equipment
20/248 . . . . the end-user application involving UPS systems or standby or emergency generators
20/30 . . . Smart metering
20/32 . . . Systems characterised by remote reading
20/322 . . . from a fixed location
20/325 . . . from a mobile location
20/327 . . . The remote reading system including mechanisms for turning on/off the supply
20/34 . . . Systems which determine the environmental impact of user behavior
20/36 . . . Methods or devices for detecting or reporting abnormalities, e.g. faults, outages, leaks
20/38 . . . Identification of individual loads by analysing current or voltage waveforms
20/40 . . . Displaying of usage with respect to time, e.g. monitoring evolution of usage, relating usage and weather conditions
20/42 . . . Utility meters which are networked together, e.g. within a single building
20/44 . . . Displaying utility price or cost
20/46 . . . Remote display of meters readings
20/48 . . . Methods for determining the topology of meters in a network
20/50 . . . Retrofitting of installed meters
20/52 . . . Systems oriented to metering of generated energy or power
20/525 . . . Monitoring the performance of renewable electricity generating systems, i.e. of solar panels

30/12 . . . Remote or cooperative charging
30/14 . . . Details associated with the interoperability, e.g. vehicle recognition, authentication, identification or billing

Communication or information technology specific aspects
supporting electrical power generation, transmission, distribution or end-user application management

40/00 . . Systems for electrical power generation, transmission, distribution or end-user application management characterised by the use
communication or information technologies, or communication or information technology specific aspects supporting them

40/10 . . . characterised by communication technology
40/12 . . . . characterised by data transport means between the monitoring, controlling or managing units and monitored, controlled or operated electrical equipment
40/121 . . . . Using the power network as support for the transmission
40/122 . . . . . Using pulsed signals
40/123 . . . . . Using modification of a parameter of the network power signal
40/124 . . . . . using wired telecommunication networks or data transmission busses
40/125 . . . . . Using phone lines
40/126 . . . . . Using wireless data transmission
40/127 . . . . . by means of mobile telephony
40/128 . . . . . involving the use of Internet protocol
40/14 . . Communication technology specific aspects
40/143 . . . . using dedicated transmission supports
40/146 . . . . . using power networks as support for transmission
40/16 . . . . Details of management of the overlaying communication network between the monitoring, controlling or managing units and monitored, controlled or operated electrical equipment
40/162 . . . . related to configuration or provisioning
40/164 . . . . related to network topology
40/166 . . . . related to fault management
40/168 . . . . . for performance monitoring
40/18 . . . . Network protocols supporting networked applications, e.g. including control of end-device applications over a network
40/20 . . Information technology specific aspects
40/22 . . . Computer aided design [CAD]; Simulation; Modelling
40/24 . . . Arrangements for network security or for protecting computers or computer systems against unauthorised activity, e.g. cyber security

Market activities related to the operation of systems integrating
technologies related to power network operation and
communication or information technologies

50/00 Market activities related to the operation of systems integrating technologies related to power network operation or related to communication or information technologies

50/10 . . Energy trading, including energy flowing from end-user application to grid
50/12 . . Billing, invoicing, buying or selling transactions or other related activities, e.g. cost or usage evaluation
Market activities related to the operation of systems integrating technologies related to power network operation...

50/14  Marketing, i.e. market research and analysis, surveying, promotions, advertising, buyer profiling, customer management or rewards

50/16  Energy services, e.g. dispersed generation or demand or load or energy savings aggregation