

|                           | Summary Description<br>(Discharge Period)      | Potential Application<br>Demand                 | Flywheels |      | Batteries |     |      |     |     |
|---------------------------|--|---|-----------|------|-----------|-----|------|-----|-----|
|                           |  |   | Fast      | Slow | Li-ion    | PbC | ZnBr | NaS | LAB |
| Generation Applications   | Governor response (< 15 minutes)               | 1-5% of system generating capacity              | ●         | ○    | ●         | ○   | ○    | ○   | ○   |
|                           | Frequency regulation (15 to 30 minutes)        | 1-2% of system peak power                       | ○         | ●    | ●         | ○   | ○    | ○   | ○   |
|                           | Spinning reserves (15 to 30 minutes)           | Matched to largest facility in control area     |           | ○    | ●         | ●   | ○    | ○   | ○   |
|                           | Balancing, real-time dispatch (1 hour or more) | 2-3% of system generating capacity              |           |      | ○         | ●   | ○    | ○   | ○   |
|                           | Intra-day production shifting (6 to 12 hours)  | 30-50% of renewable generating capacity         |           |      | ○         | ○   | ●    | ●   | ○   |
| Transmission Applications | Renewables buffering (6 to 12 hours)           | 20-30% of renewable peak power generation       |           |      | ○         | ○   | ●    | ●   | ○   |
|                           | Congestion relief (1 hour or more)             | Matched to typical congested power on path      |           |      | ○         | ●   | ○    | ○   | ○   |
|                           | Transmission reliability (< 15 minutes)        | Matched to typical congestion patterns          | ●         | ○    | ●         | ○   | ○    | ○   | ○   |
|                           | Transmission upgrade deferral (1 hour or more) | Defer transmission line upgrade or construction |           |      | ○         | ●   | ●    | ●   | ○   |
|                           | Substation upgrade deferral (1 hour or more)   | Defer substation upgrade or construction        |           |      | ○         | ●   | ●    | ●   | ○   |
| End User Applications     | Distributed renewable storage (1 hour or more) | Difference between peak generation and peak use |           |      | ○         | ●   | ●    | ●   | ○   |
|                           | Distributed demand shifting (1 hour or more)   | Equal to or less than peak load                 |           |      | ○         | ●   | ●    | ●   | ○   |
|                           | Distributed power backup (< 15 minutes)        | Equal to peak load protection                   |           | ●    | ●         | ●   | ○    | ○   | ○   |
|                           | Transit system applications (< 15 minutes)     | 10 MW per station                               | ●         | ○    | ●         | ○   | ○    | ○   | ○   |

- Signifies a targeted use or principal targeted use
- Signifies a secondary use or secondary targeted use