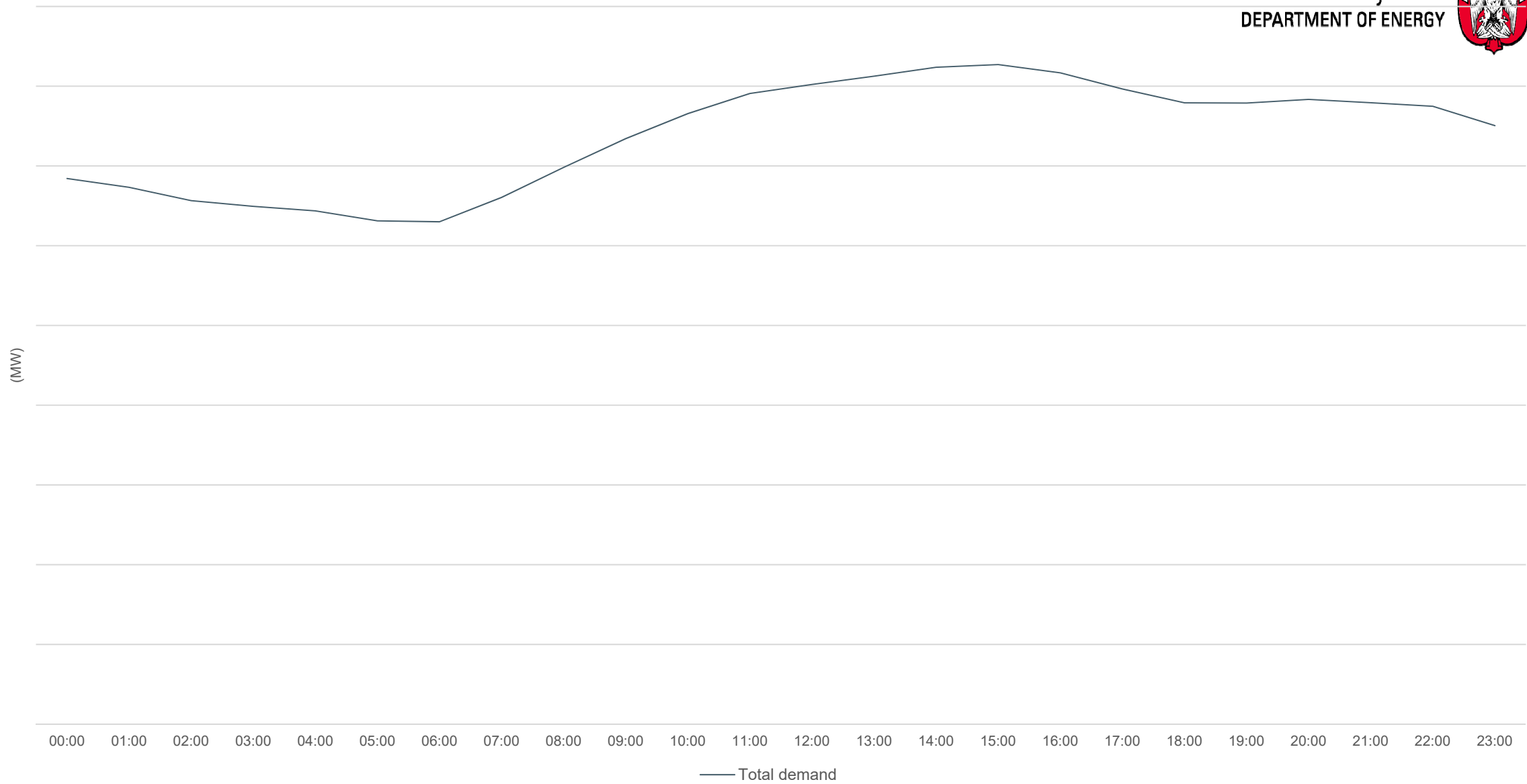




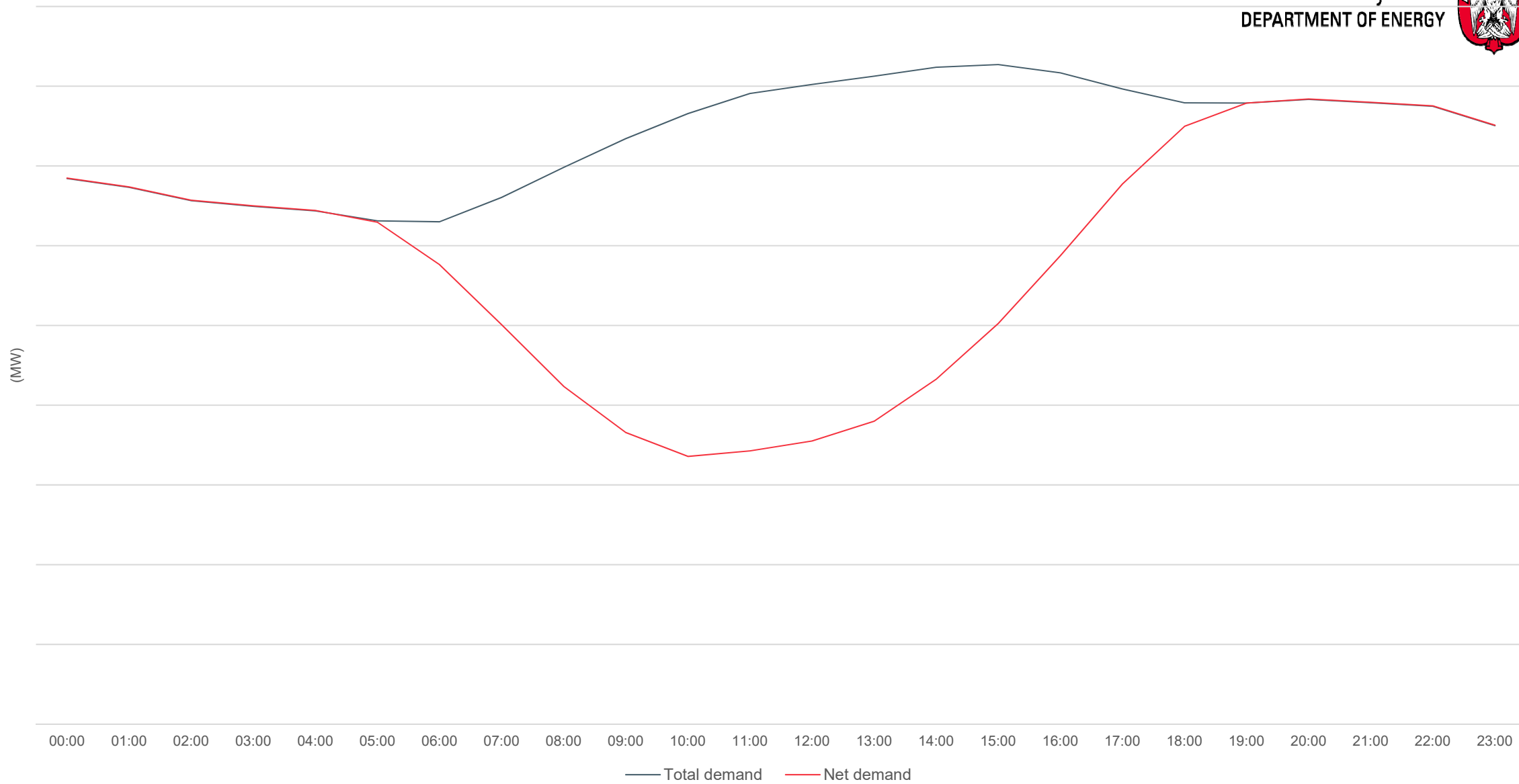
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Integration of Renewables – Challenges & Opportunities

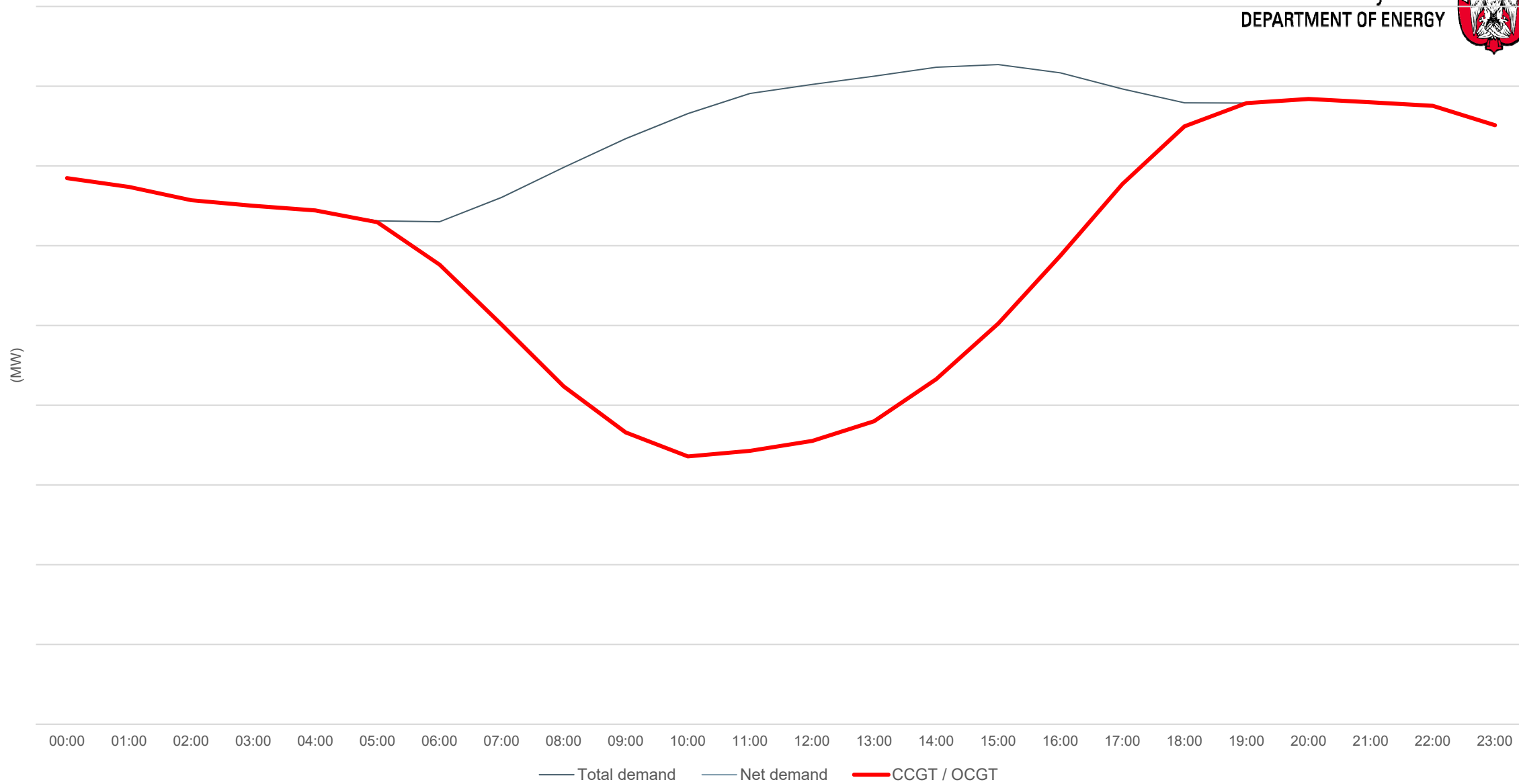
Impact of large PV volumes on peak day



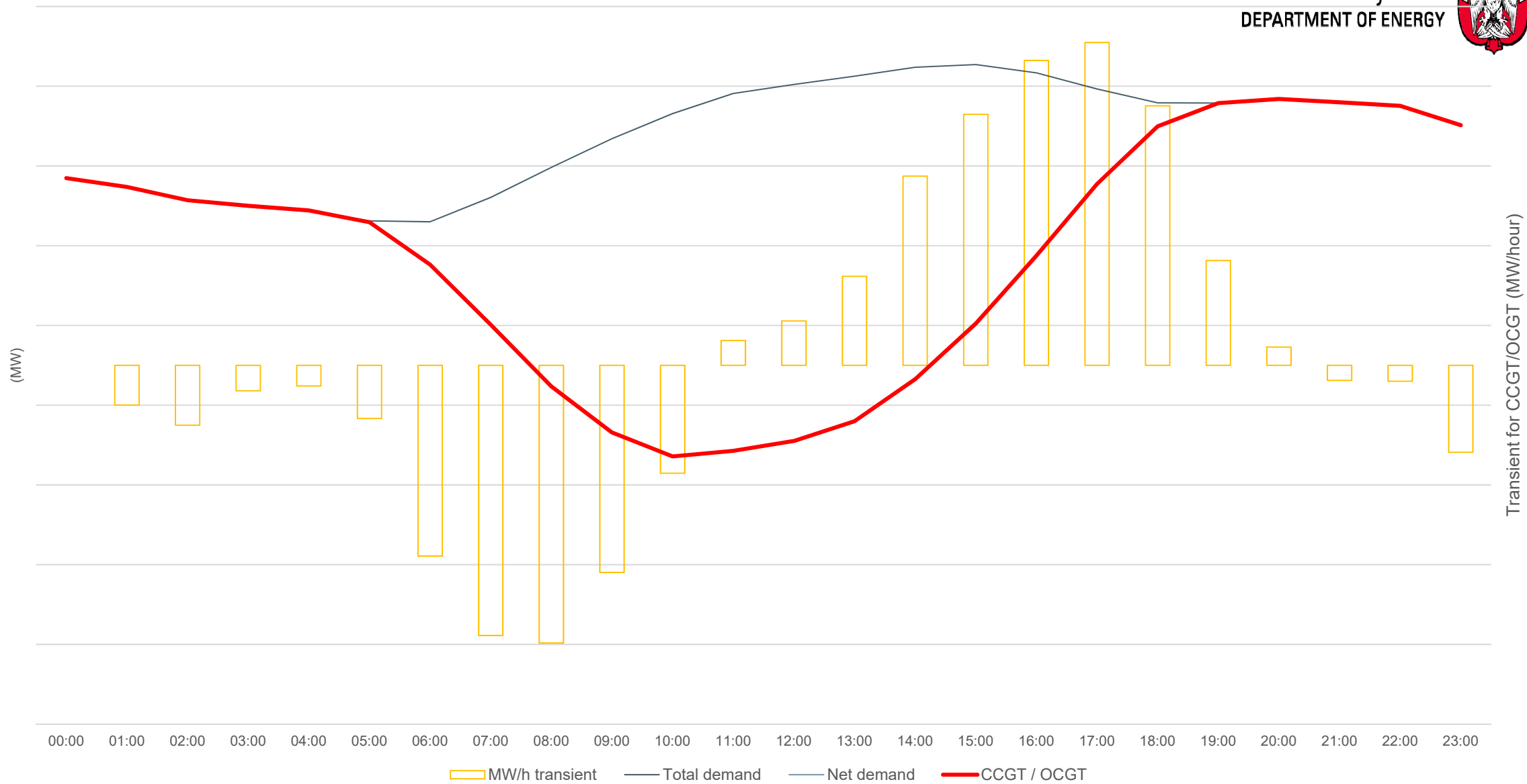
Impact of large PV volumes on peak day



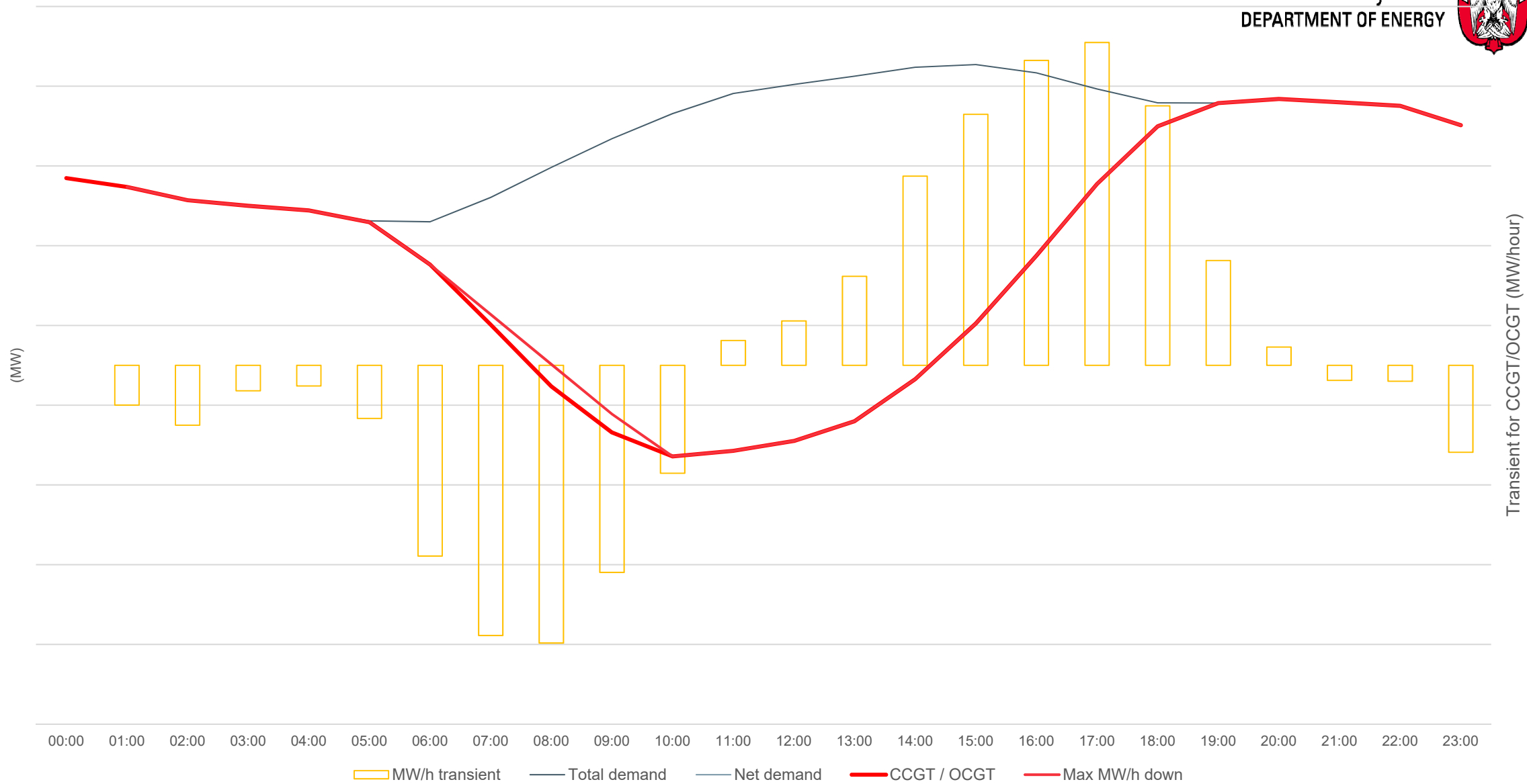
Impact of large PV volumes on peak day



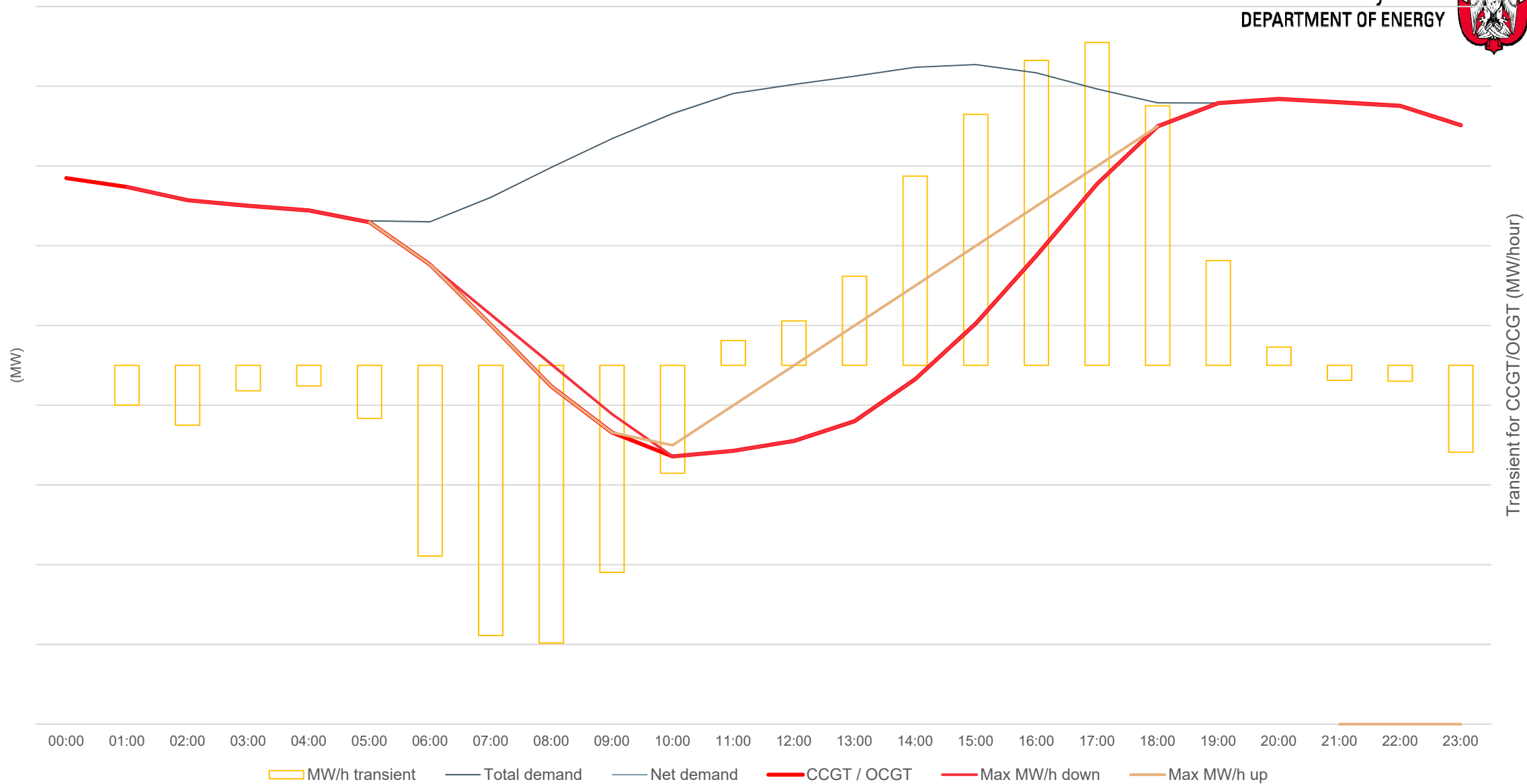
Impact of large PV volumes on peak day



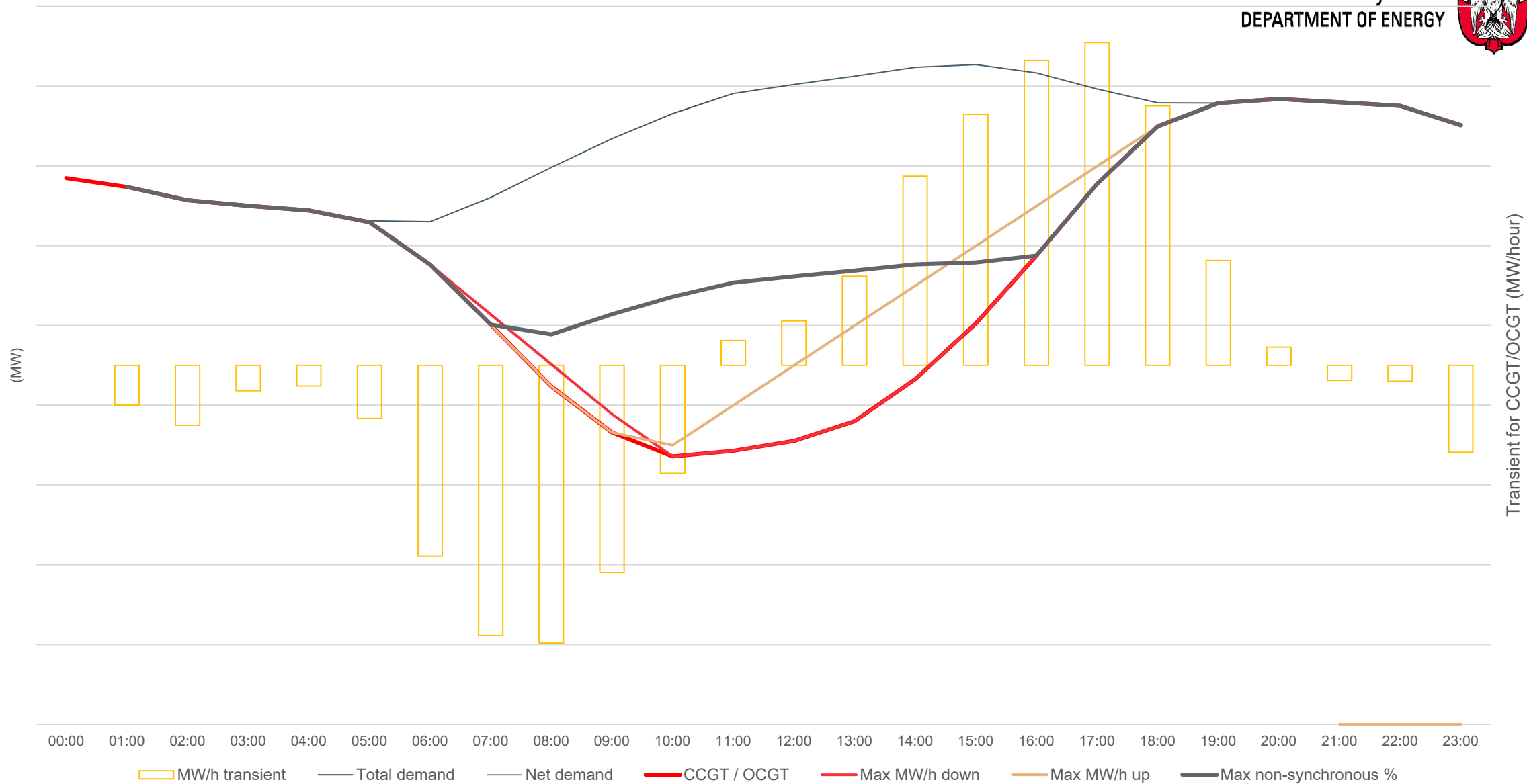
Impact of large PV volumes on peak day



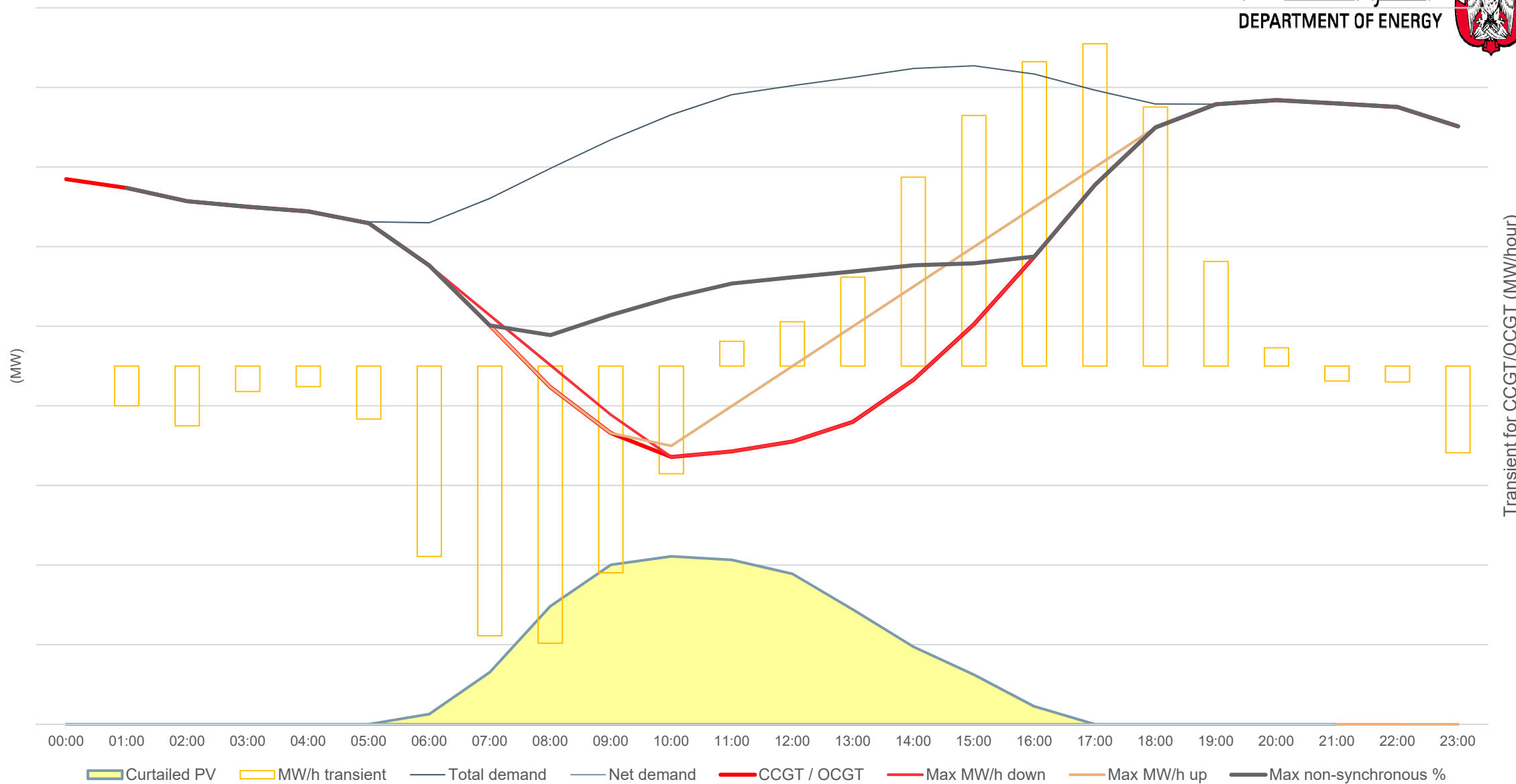
Impact of large PV volumes on peak day



Impact of large PV volumes on peak day



Impact of large PV volumes on peak day



Mitigations required for large PV capacities

1. Begin immediately to **adapt Grid Codes** in stages for future systems (≥ 10 years) with very large non-synchronous capacities
2. Focus on **enhanced flexibility** of thermal generation fleet (start-up times, GT min load, open cycle operation, etc.)
3. **Grid services** from PV (AGC, reserves, synthetic inertia, etc.)
4. **Demand side** (time of use, EV smart charging, demand response, load shifting, water heating, embedded storage, etc.)



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Thank you.