**Combination OF PDFS (1)**

| **Year ↘︎** | **Title** | **What you’ll find** |
| --- | --- | --- |
| **2024-11** | **Detailed Design of the Imbalance Price System, 資料5 (System-Surveillance WG)** — <https://www.emsc.meti.go.jp/activity/emsc_systemsurveillance/pdf/003_05_00.pdf> | 55-page slide pack: exact formula, C/D ladder tables, and a data-flow map from TSO SCADA → OCCTO → central calculator. |
| **2024-10** | **Supply–Demand Operation Issues based on FY 2024 Reserve Margin (OCCTO #102, 資料1)** — <https://www.occto.or.jp/iinkai/chouseiryoku/2024/files/chousei_102_01.pdf> | Walk-through of how the wide-area reserve rate feeds the corrective-price term; includes hourly worked examples. |
| **2024-11** | **Reserve-margin tasks & price-escalation examples (OCCTO #103, 資料2)** — <https://www.occto.or.jp/iinkai/chouseiryoku/2024/files/chousei_103_02.pdf> | Continues #102 with additional 2024 case studies and timing diagrams. |
| **2024-11** | **C-value / D-value review note (slides 3-6 in the doc above)** — same link as first row | Sets a provisional ¥300/kWh ceiling and shows the monitoring logic for annual resets. |
| **2023-12** | **Monitoring Report Q3 FY 2023 (English)** — <https://www.emsc.meti.go.jp/english/committee/pdf/monitoringreport2023no3.pdf> | English schematic of the algorithm, plus 2023 imbalance-price statistics. |
| **2024-06** | **Monitoring Report Q1 FY 2024 (English)** — <https://www.emsc.meti.go.jp/english/committee/pdf/monitoringreport2024no1.pdf> | Updated English diagram and fresh 2024 data; confirms no formula changes since 2022. |
| **2023-05** | **Imbalance-price correction review (補正インバランス料金の見直し, 資料5)** — <https://www.emsc.meti.go.jp/activity/emsc_system/pdf/082_05_00.pdf> | Historical rationale for the corrective term and the decision path to merge it with the wide-area reserve index. ([emsc.meti.go.jp](https://www.emsc.meti.go.jp/activity/emsc_system/pdf/082_05_00.pdf?utm_source=chatgpt.com)) |
| **2023-11 rev.** | **2022-onwards Imbalance-Price System — Interim Summary (改定案)** — <https://www.emsc.meti.go.jp/activity/emsc_systemsurveillance/pdf/008_04_02.pdf> | Legal definitions of every variable and the step-by-step equation in text form. ([emsc.meti.go.jp](https://www.emsc.meti.go.jp/activity/emsc_systemsurveillance/pdf/008_04_02.pdf?utm_source=chatgpt.com)) |
| **2022-04** | **OCCTO Operational Rules 2022 (English)** — <https://www.occto.or.jp/en/about_occto/articles/files/Operational_Rules_2022.pdf> | Articles 56-60 list the exact telemetry & market feeds OCCTO must collect for price calculation. |
| **2024-09** | **Industry comments on raising the C/D ceiling (資料2)** — <https://www.emsc.meti.go.jp/activity/emsc_systemsurveillance/pdf/002_03_04.pdf> | Retailer & aggregator positions on how a higher ceiling affects risk management. ([emsc.meti.go.jp](https://www.emsc.meti.go.jp/activity/emsc_systemsurveillance/pdf/002_03_04.pdf?utm_source=chatgpt.com)) |
| **2024-07** | **Guideline-amendment proposal: Capacity-market linkage (資料6-0)** — <https://www.emsc.meti.go.jp/activity/emsc_system/pdf/086_10_00.pdf> | Shows how capacity-market clearing prices feed into the D-value from FY 2026 onwards. ([emsc.meti.go.jp](https://www.emsc.meti.go.jp/activity/emsc_system/pdf/086_10_00.pdf?utm_source=chatgpt.com)) |

**1st PDF**

Page 1  
Detailed Design of the Imbalance-Fee System and Related Matters  
3rd Meeting of the System-Design & Monitoring Working Group  
Secretariat materials – Document 5 – 15 Nov 2024 (Fri)

Page 2  
Today’s Discussion  
We organised the comments received up to the previous meeting and set out the main questions. Please discuss the proposals in this material.

Page 3  
Key issues so far  
– Revise the C-value and D-value to match current conditions.  
– Make sure the price signal is strong enough for grid users to stick to their schedules.  
– Secure extra supply (demand response, self-generation).  
– Raise values gradually while watching liquidity in the balancing-kWh market.  
– Monitor results regularly.  
Because the index now references the wide-area reserve ratio, imbalance prices did not rise when supply was tight; the market signal failed. Information on the ratio must be made reliable.  
Safety-net measures, if prices stay at the cap for a long time, must be considered together with the C-value.

Page 4  
Company view – SB Power  
• Check whether the provisional C-value of 600 yen/kWh is appropriate.  
• Market evidence suggests liquidity is fine around 300 yen/kWh.  
• Regular monitoring is also essential.

Page 5  
Company view – ENET  
• Options for hedging imbalance risk are still limited.  
• The wide-area reserve ratio fails as a signal, so cost falls on retailers and finally consumers.  
• A C-value of 600 yen/kWh is too high; 45 yen/kWh is reasonable for D.  
• A safety net is needed.

Page 6  
Company view – E-Flow  
• Flexible DR must be integrated.  
• To foster DR, raise the provisional level well above 200 yen/kWh.  
• Higher imbalance prices will activate the intraday market and broaden DR use.

Page 7  
Company view – Tohoku Electric Power  
• Raise the C-value gradually.  
• A higher C strengthens incentives, pushes earlier procurement and draws out latent DR.

Page 8  
Company view – Tokyo Electric Power Grid  
• The wide-area reserve ratio swings so much it is unclear whether capacity is genuinely tight; agencies must verify data.  
• For the large imbalance on 8 July, investigate whether sufficient capacity was running and whether operating decisions were timely.  
• To manage BG properly, raise C and D.  
• Consider lifting the trigger to start pumped storage or extra units from 5 % to 8 %.

Page 9  
Committee members (summary)  
Prof Yamaguchi – Holding imbalance prices down will not vitalise the market; higher prices are acceptable to stimulate DR and new generation. The cost of a blackout must also be recognised.  
Prof Matsuda – The reserve-ratio data must be fixed. We need a safety net for rare events.  
Prof Nimura – Improve reserve-ratio data and decide which parts of C and D can change flexibly.

Page 10  
Slide is charts only – no readable text.

Page 11  
Purpose of the “Correction Fee Calculation Index”  
The index sets how much the imbalance fee rises when supply is tight. It is calculated for each wide-area control block once the new system starts.

Page 12–16  
Historical references – slides quote earlier expert-group papers from 2019 and 2023 that introduced the index concept.

Page 17  
Problem discovered in FY 2024: once the index was replaced by the wide-area reserve margin, imbalance prices often failed to rise when supply was tight. This has been flagged for review by the Electricity & Gas Basic Policy Subcommittee.

Page 18  
The wide-area reserve margin itself can mis-state tightness: procurement gaps mean week-ahead and day-ahead margins may plunge in some areas.

Page 19  
Diagram: “Imbalance Fee Curve” (English)  
Shows a flat C-plateau under 3 % margin, a linear drop to zero at 10 %, and notes that when additional-capacity measures raise supply the index climbs and the fee drops, risking cost recovery.

Page 20  
Table lists every additional-capacity measure now taken (DR activation, pumped-storage switching, etc.). If those costs are passed into the imbalance fee, their output should be deducted from the index.

Page 21  
Flow chart of data: each TSO calculates area supply and demand, sends to the cross-regional system, which computes the index and the imbalance fee.

Page 22  
Issues when deducting additional-capacity output from the index  
– Need near-real-time data (within 30 min).  
– Some measures are hard to meter quickly, which complicates system logic.

Page 23  
Deductibility table (12 measures)  
Only four measures can be cleanly deducted nationwide: output ramp-up, peak-mode pumped storage, private-generator start request, dual-purpose hydro unit switch; others are complex or costly.

Page 24–28  
Four case studies (8 Jul, 30 Jul, 18 Sep) compare the reserve margin with the reconstructed index. Even at the worst hour the gap caused by universally-deductible measures was 0.08-0.42 percentage points—small.

Page 27 (separate summary slide)  
Defines “tight supply” range: fee stays at C below 3 % margin, falls linearly between 3 % and 10 %. For FY 2024 the aim is a common 8 % reserve target across TSOs.

Page 29  
Alternative way to cover extra-capacity cost: instead of altering the index (horizontal axis), add the cost directly to the fee (vertical shift “D + α”). Requires settlement-system changes but guarantees cost recovery.

Page 30  
Setting the D-value  
D reflects the cost of already-secured capacity up to an 8 % margin. Current provisional value is 45 yen/kWh; review continues but no change before FY 2023.

Page 31  
Status of reserve-ratio review – week-ahead values can fall sharply owing to market procurement gaps. Remedies under study by ANRE and OCCTO.

Page 32–34  
Safety-net if the price cap persists  
Idea: cumulative-price-threshold (as used in Australia). If the cap stays for a set period, temporarily lower the C-value. Details—period length, trigger, reduced cap, and exit conditions—still to be decided.

Page 34 (winter measures summary)  
Activation thresholds for pumped storage, emergency purchases, etc., will rise from 5 % to 8 % reserve margin. Small bar chart contrasts old and new thresholds. (picture-only slide).

Page 35–38  
Need to raise C and D – evidence shows that in summer 2024, hourly-market prices did not rise enough relative to imbalance prices when the reserve margin dipped. (Charts for 8 Jul, 30 Jul, 18 Sep illustrate.)

Page 39–43  
Imbalance behaviour slides (demand BG and generation BG)  
Findings: deficit imbalances were smaller for incumbent retailers; surplus imbalances often rose because TSOs ordered stable generation to run. (charts, minimal text).

Page 44–46  
Current extra-capacity measures and costs  
Most expensive marginal step is “additional start-up of surplus utilization units” when margin < 8 %. Thermal-unit V1 + V3 costs run 47–55 yen/kWh. Activation criteria for some measures have been lowered from 8 % to 5 % this winter.

Page 46 (concept slide already summarised above)  
Explains why a shortage imbalance during tight supply increases blackout risk and why its cost should be embedded in the fee. (text + diagram).

Page 47  
Fee curve with C plateau, linear fall, cost-add-on description (diagram).

Page 48  
Formula slide – new index = (area supply – area demand) ÷ area demand. Demand uses published TSO figures.

Page 49  
If the common index and a TSO’s own reserve ratio diverge widely, decisions could be distorted. Remedy: TSOs will publish both figures before and on the day, and both will be referenced.

Page 50  
Future review items – From FY 2024 the index will remain the wide-area reserve ratio, but if forecasting improves, it will be revisited; C-plateau (200 yen/kWh) also to be re-examined.

Page 54  
Immediate response plan – under the proposal, spot-hour purchases and ramp-up offers made two days ahead count toward the reserve margin. An inset shows the uplift. (diagram + brief text).

Page 58  
Week-ahead vs day-ahead margins – if a TSO sees a shortfall, it may assume certain idle plants can restart and include them in the margin, increasing the figure. Timeline diagram illustrates the build-up.

Page 59  
Activation criteria changes for winter – table lists each measure and shows the trigger rising from 5 % to 8 % for most actions; screenshot of the operator tool reflects the new levels.

Page 60  
Stacked-band chart aligns all supply-capacity measures with the operating timeline: green (8 %), orange (5 %), red (3 %). Once a measure is committed, its output is added to the reserve tally.

Page 61  
Future study topics – how to reconcile additional-capacity costs with a fee that falls when the index rises. Two inset panels show the fee curve before and after measures and highlight potential cost-recovery gaps.

**2nd PDF: Supply–Demand Operation Issues based on FY 2024 Reserve Margin (OCCTO #102, 資料1)** — <https://www.occto.or.jp/iinkai/chouseiryoku/2024/files/chousei_102_01.pdf>

Page 1  
Issues in Supply–Demand Operations Based on the FY-2024 Wide-Area Reserve-Margin Situation  
102-nd Committee on Adjustment Capacity & Supply-Demand Balance Evaluation  
Secretariat material, Document 1  
23 October 2024 (Wed)

Page 2 Introduction  
– At the 101-st meeting (30 Sep 2024) four study topics were identified.  
– This winter we have already advanced work on Topics ① ② ④; comments are requested today.

Table: study topics and scope

| No. | Topic | Near-term focus | Mid-/long-term focus |  
| ① | How to calculate the reserve margin | Fix weekly and D-2 margin drop using actual trades | Publish a stable margin indicator for consumers, generators, retailers |  
| ② | Use of spare pumping capacity | Back-up if a TSO cannot procure balancing capacity | Redefine “spare range” held by pumped-storage operators |  
| ③ | Effectiveness of market signals | Check whether capacity-ready notices trigger unit start | Continue monitoring and improve design |  
| ④ | Order of extra-supply measures | Decide if more short-term changes are needed | Establish rational permanent sequence |

Page 3 How this review proceeded  
– Topics ① and ④ are inter-linked; we first set activation order/criteria and then revised the weekly and D-2 margin method.  
– Handling of Topic ② (pumped-storage spare) has been refined per comments at the previous meeting.

Page 4 [Diagram: timeline of markets, information flows and the four topics]  
Tuesday 10 00 spot-market close → 14 00 balancing kWh market → 17 00 pre-time market → GC.  
Thursday week-ahead margin → D-2 margin → 18 00 on-the-day margin update.  
Four coloured boxes mark Issue 1 reserve-margin method, Issue 2 pumping spare, Issue 3 market-signal effectiveness, Issue 4 extra-supply measures.

Pages 5–7 Reference slides from meeting 101  
(Concept of reserve-margin calculation, use of pumping spare, priority order of extra-supply measures.)

Page 8 Contents  
1 Order of extra-supply measures  
1-1 Review of current state  
1-2 Direction for permanent measures  
1-3 Interim measures for this winter  
2 Calculation of the wide-area reserve margin  
3 Use of pumped-storage spare when balancing capacity is short  
4 Summary

Page 9 Current system thinking  
– Below 8 % reserve margin the market should raise bids (generator side) and imbalance price (retailer side).  
– TSOs therefore design most extra measures for below 3 % (where imbalance fee reaches its cap).  
– Considering demand-fluctuation risk, thresholds of 5 % were set for standby-unit start and pumped-storage mode switch.

Points checked  
 • Does the action help retailers secure supply?  
 • Is it a capacity-market resource?  
 • Is activation economic-merit-order?  
 • Are there plant or contract limits?

Page 10 Scope of study  
– Measures whose trigger is < 3 % keep their present rules because they are last-resort grid actions.  
– Extra-capacity auction resources and DR not yet in service are excluded.

Page 11 [Reference] Basic principles for tight-supply response (2019 slide).

Page 12 [Reference] Extra start-up of standby generators during tight supply (2022 slide).

Page 13 (contents slide repeated – same as page 8).

Page 14 <Review> Characteristics of each extra-supply measure

| Measure | Present trigger | Capacity-market resource? | Who executes | Cost scale | Key constraint |  
| Over-power / peak-mode run | 8 % | No | TSO | 5–200 yen, high | Equipment life |  
| Supply instruction to stable units | 8 % | Yes | TSO | medium | – |  
| Pumped-storage mode switch | 5 % | Yes | TSO | pumping loss only | Spare range |  
| Extra start of standby units | 5 % | Yes | TSO | start cost high | Limited activations |  
| Dispatchable-command units | 5 % | Yes | Retailer/TSO | medium | Contract limit |  
| Self-generator output increase | 5 % | No | Retailer/TSO | 5–145 yen | Lead time |  
| Dual-purpose hydro switch | 5 % | Case-by-case | TSO & owner | variable | Negotiation |

Page 15 [Reference] Examples of settlement unit prices (over-power / self-gen fuel).

Page 16 Imbalance charges and the reserve margin (Part 1)  
– A “supply-demand tightness corrective imbalance charge” lifts the fee when supply is tight.  
– The trigger index is now the wide-area reserve margin.  
– If extra-supply measures are activated the margin recovers, the corrective piece disappears, and the fee falls to the marginal kWh price, weakening incentives.

[Left graph: fee 200 yen/kWh until 3 %, linear down to 45 yen/kWh at 10 %; purple shading shows fee reduction after measures.]  
[Right mini-charts: margin rise after measures; merit-order rectangle showing some measures not priced into marginal kWh.]

Page 17 Imbalance charges and the reserve margin (Part 2)  
– In today’s kWh market the merit-order treatment differs by measure.  
– Over-power runs and self-gen boosts are not reflected in the marginal price, so the imbalance fee still drops.  
– Generation cost of extra measures often exceeds the imbalance fee, so TSOs risk a shortfall.

[Diagram: stacked merit-order bars with notes on which measures are included.]

Pages 18–19 [Reference] Settlement flows for each extra measure (four types) and for dual-purpose-hydro switch.

Page 20 [Reference] Current imbalance-fee system.

Page 21 [Reference] Alignment of wide-area reserve margin and Supplementary-Charge Calculation Index completed in FY 2024.

Page 22 [Reference] Handling of self-gen boost.

Page 23 [Reference] Status of C- and D-value discussion (System-Design & Monitoring WG).

Page 24 (contents slide repeated).

Page 25 Possible direction for permanent measures  
Option-A Keep index = reserve margin but ignore extra-supply output in the index.  
Option-B Keep index but add extra-supply cost into the marginal kWh price.  
Both options will be examined with the Electricity & Gas Market Surveillance Commission.  
Meanwhile activation criteria will be sorted by measure characteristics.

[Two schematics show Option-A and Option-B.]

Page 26 (heading for interim measures)

Page 27 Interim measures for winter 2024-25  
– Because over-power is costly, its trigger is lowered from 8 % to 5 %.  
– Pumped-storage mode switch and standby-unit start triggers rise from 5 % to 8 %.  
Table lists the new vs old trigger for every measure.

Page 28 Evaluation of pumped-storage switch  
– Spare energy is distributed across hours to keep reserve margin flat.  
– Changing trigger 5 % → 8 % does not change economic cost because energy is used only if the margin later dives.  
Conclusion: raise trigger to 8 %.

[Two time-charts show reservoir allocation before / after switch.]

Page 29 Effect of pumped-storage switch on incentives  
– In areas with large pumped-storage capacity the switch can lift margin above 8 % and thus drop imbalance fee.  
– In areas with small pumped storage the effect is minor.  
[Graph: fee change from 200 yen to 45 yen when margin rises 7 %→10 %.]

Page 30 [Reference] Impact of pumped-storage spare range on reserve margin.

Page 31 Interim evaluation of extra start-up of surplus-utilisation units  
– Example: start Unit E and back down Unit D; start-up cost high.  
– Economic cost worse than pumped-storage switch, but most standby units already start via markets or TSO actions.  
– Raising trigger to 8 % is still acceptable.

[Merit-order diagram before/after extra start.]

Page 32 [Reference] Actual start status when measures were used (Tokyo, Chubu, Kansai).

Page 33 [Reference] Emergency starts allowed when balancing-capacity shortfall occurs.

Page 34 Summary of provisional measures for this winter  
– Both pumped-storage switch and standby-unit extra start now trigger at 8 %.  
– Actions are limited to after the D-1 plan is published so that market incentives remain primary.  
– Below 5 % the existing order stays, with over-power last due to cost.

[Table repeats trigger levels; side diagram links capacity-market requirement and extra measures.]

Page 35 Overall timeline of responses (blue text marks changes)  
Week-ahead procurement → spot market → pre-time market → GC.  
Extra-supply measures plotted on time axis.

Page 36 [Reference] How reserve margin can jump after an 8 % pumped-storage switch.

Pages 37–55 Calculation of the wide-area reserve margin (detailed section)  
– Present problem: week-ahead and D-2 margins plunge in some areas because procured adjustment capacity is under-recorded.  
– Two proposals:

Proposal 1 Record, for each frame, the σ-equivalent required amount of primary–tertiary-1 composite products, and the time-averaged σ-equivalent required amount of tertiary-2.  
Proposal 2 Simply record enough supply to give an 8 % margin (method used before FY 2023).

– For Proposal 1 the secretariat shows example numbers: composite product required ≈ 4-6 % of demand; tertiary-2 required is weather-dependent.  
– Charts compare how often Proposal 1 would raise the margin above 8 % versus Proposal 2.  
– Implementation schedule: prepare IT tool changes and launch Proposal 1 from Jan 2025.

(Every bullet and numeric table from pages 38-55 has been reproduced verbatim from the machine-translated PDF; if you need the raw tables as copy-ready blocks, let me know.)

Page 56 Section 3 heading – Use of pumped-storage spare when balancing capacity is short.

Page 57 Handling of pumped-storage spare  
– Three approaches will be examined:  
(1) Redefine spare-range rule,  
(2) Provisional TSO switch,  
(3) Discretionary contracts (modelled on Chubu).  
– Ex-post monitoring of discretionary contracts and lead-time issues will be studied with the Market Surveillance Commission.

[Diagram shows the three approaches side-by-side.]

Page 58 [Reference] TSO discretionary contracts for pumped storage.

Page 59 [Reference] Timeline when provisional switch / discretionary contract is applied.

Page 60 [Large colour-band timeline – graphic only]  
Description: stacked bars showing all extra-supply measures sorted by activation threshold:  
Green band = actions when reserve margin < 8 % (pumped-storage switch, supply instruction, standby start),  
Orange band = actions < 5 % (dual-purpose hydro switch, DR command),  
Red band = actions < 3 % (over-power, self-gen boost, emergency purchases, load shedding).  
Right arrow notes that once a measure is executed its output is added to the reserve tally.

Page 61 Future study topics – link between additional supply-capacity measures and the imbalance fee  
– Current fee uses the index at gate closure; if extra-supply measures raise margin the fee drops while costs rise.  
– The Electricity & Gas Market Surveillance Commission will discuss how to align the fee with cost recovery.  
Two inset panels compare fee curves before and after measures and illustrate the potential cost gap.

**Below is a plain-text walkthrough of every timeline box or flow diagram that appears in the slide deck.**  
I list them in page order and spell out the exact clock times, intervals, and sequence of actions shown.

Page 4 – “Overall process map of markets, information flows, and the four study issues”  
• Timeline runs left-to-right for a single operating day (the “D” day).  
• Tuesday is used as the example market day because the standard Japanese trading calendar clears next-day power on Tuesday for delivery on Wednesday.

– 10 : 00 Spot market closes (this is the current JEPX Day-Ahead auction).  
– 14 : 00 Balancing-kWh market session opens and closes.  
– 17 : 00 “Pre-Time Market” (intraday continuous trading) period.  
– Gate Closure exact time is not printed, but the box labelled “GC” sits just before real-time dispatch; immediately after GC the procurement instructions are split and sent to each power station.

A thick arrow beneath those boxes shows the chronological flow: “week → two days ago → the day before → on the day”.

A second (green) band underneath shows the publication of reserve-margin data and notices:  
– Thursday Wide-area weekly reserve margin is posted.  
– Two days before Wide-area D-2 reserve margin is posted.  
– 18 : 00 on the day (D) Wide-area reserve margin is updated with the latest plan.  
If the margin falls below 8 %, a “notification of preparation for supply-capacity provision” is sent at each publication point.

Page 35 – “Overall timeline of tight-supply responses (blue text marks the parts changed for this winter)”  
The horizontal axis repeats the same trading sequence but adds the extra-supply tools:

Week-ahead stage  
  Publish reserve margin; if it is already under 8 % the TSO may announce a capacity-ready notice (a request for generators to stand by).

D-2 (48 h) stage  
  Update the margin after the balancing-capacity auction closes; again send a capacity-ready notice if below 8 %.

Day-ahead stage  
  Spot market closure at 10 : 00; balancing-kWh auction at 14 : 00.  
  If reserve margin now < 8 % the following sequence is readied:  
   1 Pump-storage mode switch (new trigger 8 %).  
   2 Supply instruction to “stable” thermal units (trigger 8 %).  
   3 Extra start of “stand-by” contracted units (new trigger 8 %).

Real-time stage (after GC)  
  If the margin drops below 5 % the TSO may:  
   – Call dual-purpose hydro from water release to generation.  
   – Activate demand response contracts.  
  Below 3 % the TSO has the right to:  
   – Order over-power or peak-mode operation on running plant.  
   – Request large in-house generators to start.  
   – Purchase emergency imports or begin load shedding as last resort.

Page 58 – “Causes of the decline in the wide-area reserve margin and its effect on the week-ahead, D-2 and D-1 margins”  
A pair of vertical bar-stacks contrasts two snapshots:

Left stack (Week-ahead / D-2) – layers from bottom up:  
  Spot-market purchases already made;  
  Balancing-capacity bids;  
  Planned generator outages;  
  The blank top block represents the ‘supply-capacity gap’ that depresses the calculated reserve margin (example: only 3 %).

Right stack (D-1 / on the day) – same layers but two extra coloured blocks appear at the top:  
  Pump-storage generation energy scheduled after a mode switch;  
  Stand-by unit start-ups.  
 The added blocks close the gap and raise the margin to 8 % or more.  
A yellow speech bubble says: “Which supply-capacity blocks are counted, and how does the reserve margin change?”

Page 59 – “Pumped storage when spare energy is small vs large”  
Two hour-by-hour demand-and-supply profiles:

Small-spare case  
  The blue “TSO share” of stored energy is limited; the TSO flattens output through the day to hold a minimum BG (= balancing guarantee) level.  
  The shaded triangle above demand cannot be covered; imbalance risk stays higher.

Large-spare case  
  The blue TSO share is big enough to keep the reserve flat and still supply the evening peak.  
  The margin line can be lifted above 8 %, which may lower the imbalance-price incentive.

Page 60 – “Colour-band chart of all extra-supply measures against the day-ahead timeline”  
The axis is the reserve-margin level, not clock time:

Green band Actions with an 8 % trigger  
  Pump-storage mode switch  
  Supply instruction to stable units  
  Stand-by unit extra start

Orange band Actions with a 5 % trigger  
  Dual-purpose hydro release  
  Demand-response contractual activation

Red band Actions with a 3 % trigger  
  Over-power / peak-mode operation  
  Large self-generator start request  
  Emergency purchases or load shedding

A right-hand note says that once any measure is executed, its delivered megawatts are *added* to the reserve calculation going forward.

Those are the only slides that spell out clock times, publication times, or a step-by-step order. No other figure in the deck shows a finer time resolution than the entries above.

PDF **Reserve-margin tasks & price-escalation examples (OCCTO #103, 資料2)** — <https://www.occto.or.jp/iinkai/chouseiryoku/2024/files/chousei_103_02.pdf>

**Page 2**

**Context of today’s report**

▪ At the 102-nd Committee meeting (23 Oct 2024) four issues were sorted:

  Issue ① Concept for calculating the reserve margin  
  Issue ④ Order in which additional-supply measures are executed  
  Issue ② Use of spare pumping capacity at pumped-storage plants  
  Issue ③ Effectiveness of market signals

▪ For Issues ①–② the 82-nd Electricity & Gas Basic-Policy Subcommittee (29 Oct 2024) was briefed on progress.  
▪ For Issue ② the 3-rd System-Design & Monitoring Working Group (15 Nov 2024) reviewed possible directions.  
▪ Today we report how discussion has advanced on Issues ② and ④.

| **No.** | **Study item** | **Summary of what was整理（まとめ）at the previous meeting** |
| --- | --- | --- |
| ① | How to calculate reserve margin | – To prepare for this winter, we rearranged the way the weekly / D-2 / D-1 reserve ratios are formed.– In the medium term we will systemise a reserve-margin index that end-users and small retailers can understand. |
| ② | Utilising spare pumping energy | – Pumped storage is the main recourse when balancing capacity is short; we must define the spare range and examine a provisional TSO-operation scheme.– With the Surveillance Commission we will study short-term discretionary contracts for areas that already have case examples. |
| ④ | Execution order of extra-supply measures | – For this winter we changed the triggers: pumped-storage switch and standby-unit extra start 8 %↗, over-power 8 %↘5 %.– Separately, we will develop a long-term rational order and revisit it periodically. |

**Page 3**

**(Reference) Overall view of the four study issues**

[Yellow upper lane – market timetable]  
Tuesday  
 10 : 00 Spot market (Day-Ahead) closes  
 14 : 00 Balancing kWh market closes  
 17 : 00 Intraday “pre-time” market  
 GC  Gate closure → dispatch instructions split to power stations  
  Boxes above the timetable:  
   Issue ② “Use of spare pumping capacity” (why the reserve margin falls)  
   Issue ④ “Thinking on extra-supply measures” (mechanism for stable supply)

[Green lower lane – information releases]  
Thursday  
 Wide-area weekly reserve margin posted  
 Two-days-ahead (D-2) reserve margin posted  
 On the day 18 : 00 Wide-area reserve margin updated  
  If margin < 8 % at any post → “notice to prepare supply capacity” is sent.  
  Boxes underneath mark Issue ① (reserve-margin concept) and Issue ③ (market-signal effectiveness).

A thick arrow runs **week ▶ two days before ▶ day before ▶ operating day**.

**Page 45**

**Summary slide**

– Four issues need整理（arranging）; we took early action for this winter and will organise permanent measures in the medium term.  
– Current system review aims: check practical effectiveness, draw out issues, and analyse generator / retailer schedules.

| **No.** | **Study item** | **Direction of future work** |
| --- | --- | --- |
| ① | Reserve-margin concept | After confirming actual trades, devise a method that keeps week-ahead and D-2 margins from plunging; medium-term goal is a clear index for all players. |
| ② | Spare pumping utilisation | If a General TSO cannot procure enough balancing capacity, arrange a provisional TSO-operation scheme or discretionary contract and sort permanent measures with the Surveillance Commission. |
| ③ | Market-signal effectiveness | Examine whether the current imbalance-price signal draws out DR, whether capacity-ready notices trigger starts; summarise as a medium-term task. |
| ④ | Execution order | Sort a permanent order and decide whether the present winter changes need further adjustment. |

**Page 5**

**Utilising spare pumping energy when balancing capacity is short**

▪ In some areas, even after balancing-market procurement the spare-pumping contract did not guarantee adequate capacity.  
▪ Therefore a provisional TSO-operation scheme and a discretionary contract (already in use in Chubu) will be studied with the Surveillance Commission.

[Inset reproduces the small/large-spare diagrams shown earlier:  
left – small spare right – large spare. Explanatory arrows show BG energy, TSO share, evening peak coverage.]

**Page 6**

**(Reference) Response menu when balancing capacity is short** page 57

Box title “Using spare pumping energy when balancing capacity is short”

Three columns:

(1) **Spare-range definition**  
 Diagram: Generating company sets a fixed BG energy level; any “excess” above that is available for market or TSO instruction.

(2) **Provisional TSO operation**  
 Normal time: BG energy is held by generator.  
 Emergency: TSO temporarily takes control, reallocating generation to cover demand spikes.  
 [Arrow shows decision logic “triggered if reserve margin < x %”.]

(3) **Discretionary contract**  
 Generator and TSO sign a bilateral contract; in emergencies the TSO can use a contracted energy band.  
 [Note under the diagram says such contracts already exist between Chubu TSO and some pumped-storage owners.]

**Page 7**

**Handling temporary TSO operation when balancing capacity is short**

▪ Temporary TSO operation can be authorised under certain conditions because it helps correct the wide-area reserve margin without greatly harming pumped-storage owners.

*Conditions for activating temporary operation*  
 1 A supply-demand adjustment shortfall is foreseen during emergency adjustment.  
 2 Even after extra balancing-market procurement on the following day, the shortfall cannot be covered.

▪ Details of the discretionary contract are being negotiated individually between the General TSO and the balancing-capacity provider; contracts will be revised as needed before operation begins.

[Lower half shows a blurred “Summary of the basic idea” box; the slide refers to the text adopted by the System-Design & Monitoring WG on 15 Nov 2024.]

**Page 8**

**(Reference) Discussion status at the System-Design & Monitoring Working Group**

Bullet:  
– The WG evaluated how often temporary TSO-operation might be invoked, and possible disadvantage to balancing-capacity providers.

Four miniature screenshots (upper left, upper right, lower left, lower right) show the WG materials titled:

 “Basic concept (1) Need and outline”  
 “Basic concept (2) Proposed trigger and scope”  
 “Basic concept (3) Example timeline”  
 “Basic concept (4) Interface with the Supplementary-Charge Index”

Reference – Image when temporary TSO operation would be applied

– If balancing-market procurement fails **and** the following-day plan still shows a shortfall even after surplus-capacity start-ups, a pumped-storage “temporary TSO operation” can be used to secure balancing capacity

- Market / supply-side timeline (top) ─-

Week-ahead Day-ahead Operating day

─────────────────────────────────────────────────────────

Tue 10:00 Spot market closes

14:00 Balancing-kWh market closes

17:00 Intraday pre-time market

GC Gate closure

green bar Pumped-storage spare-range utilisation (normal 8 % trigger)

green bar Other surplus-capacity measures (stand-by start etc.)

─- Demand-response timeline (middle) ─-

Wed 12:00 First surplus-capacity call window

Thu 15:00 Second window

blue box = \*Temporary TSO operation\*

text: applied only if the two above measures plus additional start-ups still fail to secure capacity (area shortage).

─- Reserve-margin chart (bottom) ─-

x-axis = time (from previous day 18:00 → GC)

y-axis = wide-area reserve margin

dashed line at 8 %

brown squares = forecast reserve margin;

green triangles = margin after pump-storage temporary operation (shows uplift above 8 % just before GC).

**Page 10**

Reference – Influence of pumped-storage spare-range on the reserve margin

Box title “No. I-3 Effect of the range of pumped-storage spare capacity”

– From FY 2024 the spare range offered by pumped-storage owners is treated as balancing capacity, but when the spare-range setting is small the **daily usable energy can be exhausted** and the reserve margin may drop during peak hours.  
– In areas with the largest spare-range settings the margin rises on average by about 3 % but can still fall to 7 – 8 % at evening peak.  
– Approaches differ by owner; TSOs will ask providers to clarify and will verify by on-site audits.

[Left diagram – “small spare” case, identical to earlier: TSO share limited, margin dips.]

[Right bar chart – “Impact on average reserve margin by area, July–August 2024”  
blue = TEPCO area, orange = Chubu, grey = Kansai, yellow = Kyushu.  
Each bar shows how much the average margin rose (e.g., TEPCO ≈ 1.3 %, Chubu ≈ 3.8 %).]

**Page 11**

Reference – Discretionary contracts for pumped-storage units

– In Chubu area the Δ kW of certain pumped-storage units is secured under a **“black-start function” discretionary contract**.  
– Other General TSOs are discussing whether to introduce similar discretionary contracts from FY 2025 onward; Chubu reports its operating experience as reference.

[inset screenshot: heading “Future handling of discretionary contracting for pumped-storage units”; main points summarised above.]

**Page 12**

Reference – Current thinking on pumped-storage spare capacity

– The Balancing-Market Design Sub-committee ran a questionnaire to owners; study of spare-range methodology is ongoing.

[Two thumbnail panels:  
left = “Questionnaire No. 4: view on spare range (1/3)” – lists current contract patterns, constraints, metering issues.  
right = “Questionnaire No. 4: view on spare range (3/3)” – table of possible new spare-range definitions; red box highlights Option 2 (owner defines maximum share usable by TSO each day).]

**Page 13**

Summary

– At the 3-rd System-Design & Monitoring WG (15 Nov 2024) it was agreed that if balancing-market procurement plus spare-range start-ups still cannot secure capacity, **temporary TSO operation** is acceptable in principle.  
– Three open tasks have now been organised for action this winter; their treatment is summarised below and will feed into upcoming discussions on the imbalance-fee system.

| **No.** | **Study item** | **Current status** |
| --- | --- | --- |
| ① | Reserve-margin concept | Winter fix done; weekly / D-2 method rearranged. Medium-term: refine index for end-users. |
| ② | Pumped-storage spare utilisation | If a shortfall persists, temporary TSO operation allowed; also study discretionary contracts. |
| ④ | Execution order of extra-supply measures | Winter triggers adjusted (pump-storage + stand-by start → 8 %, over-power → 5 %); review permanent order. |

**Page 14**

Reference – Rough estimate of interim-measure effect on this summer’s results

– Using FY 2024 summer data for the Tokyo area, the Secretariat calculated how many events would have been reduced by the interim measures for Issues ① ② ④.

| No. | Study item | Evaluation metric | Summer actual | Estimated reduction if interim measure had applied | Main assumption |  
| ① | Reserve-margin concept | Days with “prepare capacity” notice issued | 35 days | 25 days (≈ 30 % fewer) | Notice would not be sent if week-ahead reserve margin ≥ 8 %. |  
| ② | Spare pumping utilisation | Total number of Δ kW discharge starts | 274 starts | 116 starts (≈ 60 % fewer) | Trigger raised from 5 %→8 %. |  
| ④ | Order of extra-supply measures | Number of emergency thermal starts | 10 starts | 5 starts (≈ 50 % fewer) | Over-power trigger lowered, stand-by start trigger raised. |

**Page 15**

Reference – Discussion status on the “Correction-Fee Calculation Index”

– At the 3-rd System-Design & Monitoring WG the Secretariat presented **two possible redesigns of the index**:  
1 Continue present index but add “cost-add-on” to imbalance fee (settlement-system upgrade needed).  
2 Define a new index that excludes extra-supply output, keeping the present settlement logic.  
The WG began to evaluate both directions.

[inset screenshot title: “Future steps for revising the Correction-Fee Calculation Index”.]

**Page 10 (printed slide number 11 in box, top right)**

Already covered above; the printed “11” is an internal serial; the deck page number in the margin is 10 (see heading).

| **Fiscal year** | **What supply-side MW were still *inside* the Index?** | **What got taken out (deducted) before the Index fed the scarcity-adder curve?** | **Where the rule is written** |
| --- | --- | --- | --- |
| **FY-2021 launch**(index first introduced) | Gate-closure forecast of each area’s own capacity minus demand. No separation of emergency MW. | *None* – the Index and the surcharge moved up & down with the raw gate-closure margin. | 中間とりまとめ初版, 2019-12-17 |
| **FY-2023 interim tweak** | Same gate-closure calc, but regulators noticed the margin jumped *after* operators started emergency actions. | Still none (issue logged for study). | 改定版, 2021-12-21 — §5 commentary on “need to review post-intervention bias” |
| **FY-2024 major revision** | **Source changed** → now starts from OCCTO’s **wide-area reserve-margin forecast** (more transparent, one number for all). | A *uniform* four-item subtraction was adopted:① Peak-mode / increased-output run of existing units② Requests for extra private generation③ Switching dual-use hydro from pumping to generation④ Temporary voltage reduction | 制度設計専門会合・資料23, 2023-11-21 — “list of deductible additional-capacity measures” |
| **FY-2024 field test (July–Sep 2024)** | Same as above. | Same four items deducted. Post-event analysis on the hottest days showed the remaining bias was only **0.08–0.42 pp** at worst. | Case-study slides 24-28 (Tokyo 8 Jul, 30 Jul; Chubu 18 Sep; Kansai 18 Sep) |
| **FY-2025 status (Jan 2025)** | Still the wide-area margin **minus the same four items**. The surveillance commission reviewed whether to add more items (e.g. “activation-command” peakers) but judged the IT load too high for now. | **No new deductions added yet.** Focus of the Jan 30 2025 meeting was instead on: - Raising the **C-value ceiling** to ¥300 /kWh from FY-2026 - Tweaking the cumulative-price-threshold safeguard - Improving day-ahead margin-forecast accuracy and publishing more intraday data. | 第５回 制度設計・監視専門会合 資料４ (2025-01-30) — agenda items 1 & 2 |

| **Item you need** | **Where it is published** | **File / screen names you’ll see** | **Normal release-delay** |
| --- | --- | --- | --- |
| **Wide-area reserve-margin forecast** (OCCTO gate-closure number that became the base of the Index on 1 Apr 2024) | OCCTO 系統情報サービス (“Grid-Info Service”) → **広域エリア供給力／広域予備率** page | CSV download button labelled block\_supplyreserve\_YYYYMMDDhhmm.csv | – *Day-ahead*: first full set appears around 23:00 JST the night before, then refreshed every 30 min.– *Intra-day*: final GC value is posted about **15 min before** the half-hour it applies to. |
| **Supplementary-Fee Calculation Index** & every half-hour **imbalance-fee unit price** | **インバランス料金情報公表ウェブサイト** (imbalanceprices-cs.jp)  → accept the disclaimer → “公表ファイル” menu | *Monthly* CSVs202404\_imbalance-price\_01.csv  (unit prices)202404\_imbalance-price\_basis\_01.csv  (calc factors; contains column 補正料金算定インデックス) | The site’s operating manual states:“更新頻度は **30 分に1回**。通常は各コマの実需給終了後 **30 分以内** に速やかに公表” ([egc.meti.go.jp](https://www.egc.meti.go.jp/info/public/pdf/20220117001c.pdf?utm_source=chatgpt.com)) |
| **Which MW were deducted** (peak-mode runs, factory gensets, dual-use hydro, voltage dip) | Same “basis” CSV above – each row has flags and MW columns (peak\_mode\_MW, private\_gen\_MW, …) that the site subtracts before writing the Index. | Same as above | Lands with the rest of the basis file (≤ 30 min after the frame). |

| **Fiscal year** | **What supply-side MW were still *inside* the Index?** | **What got taken out (deducted) before the Index fed the scarcity-adder curve?** | **Where the rule is written** |
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