

PJM Calculated Annual Capital Recovery Factor (CRF) for Black Start Units

Timeline for CRF

Action	Date Due By
PJM determines annual CRF inputs	March 1
PJM posts annual CRF	March 31
Deadline for contesting annual CRF	April 15
Annual revenue requirement calculation	May 3 through May 27
Annual revenue requirement with CRF in effect	June 1

Any entity contesting the annual CRF value(s) shall do so by sending an email stating the contest and the reason for the contest to BlackStart@pjm.com.

Capital Recovery Factors

Effective For Units	Effective For Dates	Depreciation	Age of Unit is (1 to 5) years old and will take 20 years to recover costs	Age of Unit is (6 to 10) years old and will take 15 years to recover costs	Age of Unit is (11 to 15) years old and will take 10 years to recover costs	Age of Unit is (16+) years old and will take 5 years to recover costs
All Black Start Units	CRF prior to June 6, 2021	15 Year MACRS	0.1180	0.1348	0.1767	0.3097
Units entering Black Start Service during 06/06/2021 - 05/31/2022	CRF for 2021/2022 Delivery Year (06/06/2021 - 05/31/2022)	100% Bonus	0.106	0.120	0.151	0.250
(Units entering Black Start Service during 06/01/2022 - 12/31/2022) OR (Units continuing 100% bonus depreciation rate from above)	CRF for 2022/2023 Delivery Year (06/01/2022 - 12/31/2022)	100% Bonus	0.105	0.119	0.150	0.249
Units continuing 100% bonus depreciation rate from above	CRF for 2022/2023 Delivery Year (01/01/2023 - 05/31/2023)	100% Bonus	0.105	0.119	0.150	0.249

Units continuing 100% bonus depreciation rate from above	CRF for 2023/2024 Delivery Year (06/01/2023 - 05/31/2024)	100% Bonus	0.111	0.125	0.155	0.253
Units continuing 100% bonus depreciation rate from above	CRF for 2024/2025 Delivery Year (06/01/2024 - 05/31/2025)	100% Bonus	0.105	0.119	0.150	0.249
Units continuing 100% bonus depreciation rate from above	CRF for 2025/2026 Delivery Year (06/01/2025 - 05/31/2026)	100% Bonus	0.105	0.119	0.150	0.249
Units continuing 100% bonus depreciation rate from above	CRF for 2026/2027 Delivery Year (06/01/2026 - 05/31/2027)	100% Bonus	0.106	0.120	0.151	0.250
Units entering Black Start Service during 01/01/2023 - 05/31/2023	CRF for 2022/2023 Delivery Year (01/01/2023 - 05/31/2023)	80% Bonus	0.108	0.122	0.155	0.260
(Units entering Black Start Service during 06/01/2023 - 12/31/2023) OR (Units continuing 80% bonus depreciation rate from above)	CRF for 2023/2024 Delivery Year (06/01/2023 - 12/31/2023)	80% Bonus	0.114	0.128	0.161	0.265
Units continuing 80% bonus depreciation rate from above	CRF for 2023/2024 Delivery Year (01/01/2024 - 05/31/2024)	80% Bonus	0.114	0.128	0.161	0.265
Units continuing 80% bonus depreciation rate from above	CRF for 2024/2025 Delivery Year (06/01/2024 - 05/31/2025)	80% Bonus	0.108	0.122	0.155	0.260

Units continuing 80% bonus depreciation rate from above	CRF for 2025/2026 Delivery Year (06/01/2025 - 05/31/2026)	80% Bonus	0.108	0.122	0.155	0.260
Units continuing 80% bonus depreciation rate from above	CRF for 2026/2027 Delivery Year (06/01/2026 - 05/31/2027)	80% Bonus	0.109	0.124	0.156	0.261
Units entering Black Start Service during 01/01/2024 - 05/31/2024	CRF for 2023/2024 Delivery Year (01/01/2024 - 05/31/2024)	60% Bonus	0.117	0.132	0.166	0.276
(Units entering Black Start Service during 06/01/2024 - 12/31/2024) OR (Units continuing 60% bonus depreciation rate from above)	CRF for 2024/2025 Delivery Year (06/01/2024 - 12/31/2024)	60% Bonus	0.110	0.125	0.160	0.271
Units continuing 60% bonus depreciation rate from above	CRF for 2024/2025 Delivery Year (01/01/2025 - 05/31/2025)	60% Bonus	0.110	0.125	0.160	0.271
Units continuing 60% bonus depreciation rate from above	CRF for 2025/2026 Delivery Year (06/01/2025 - 05/31/2026)	60% Bonus	0.110	0.125	0.160	0.271
Units continuing 60% bonus depreciation rate from above	CRF for 2026/2027 Delivery Year (06/01/2026 - 05/31/2027)	60% Bonus	0.112	0.127	0.162	0.272
Units entering Black Start Service during 01/01/2025 - 01/18/2025	CRF for 2024/2025 Delivery Year (01/01/2025 - 05/31/2025)	40% Bonus	0.113	0.129	0.165	0.282

Units continuing 40% bonus depreciation rate from above	CRF for 2025/2026 Delivery Year (06/01/2025 - 12/31/2025)	40% Bonus	0.113	0.129	0.165	0.282
Units continuing 40% bonus depreciation rate from above	CRF for 2025/2026 Delivery Year (01/01/2026 - 05/31/2026)	40% Bonus	0.113	0.129	0.165	0.282
Units continuing 40% bonus depreciation rate from above	CRF for 2026/2027 Delivery Year (06/01/2026 - 05/31/2027)	40% Bonus	0.115	0.130	0.167	0.283
Units entering Black Start Service during 01/19/2025 - 05/31/2025	CRF for 2024/2025 Delivery Year (01/19/2025 - 05/31/2025)	100% Bonus	0.105	0.119	0.150	0.249
(Units entering Black Start Service during 06/01/2025 - 12/31/2025) OR (Units continuing 100% bonus depreciation rate from above)	CRF for 2025/2026 Delivery Year (06/01/2025 - 12/31/2025)	100% Bonus	0.105	0.119	0.150	0.249
(Units entering Black Start Service during 01/01/2026 - 05/31/2026) OR (Units continuing 100% bonus depreciation rate from above)	CRF for 2025/2026 Delivery Year (01/01/2026 - 05/31/2026)	100% Bonus	0.105	0.119	0.150	0.249
(Units entering Black Start Service during 06/01/2026 - 05/31/2027) OR (Units continuing 100% bonus depreciation rate from above)	CRF for 2026/2027 Delivery Year (06/01/2026 - 05/31/2027)	100% Bonus	0.106	0.120	0.151	0.250

Capital Recovery Factor Equation

Capital Recovery Factors (CRF) are calculated using the equation below:

$$CRF = \frac{r (1 + r)^N \left[1 - \frac{sB}{\sqrt{1 + r}} - s(1 - B)\sqrt{1 + r} \sum_j^L = 1 \frac{m_j}{(1 + r)^j} \right]}{(1 - s) \sqrt{1 + r} [(1 + r)^N - 1]} \dots$$

Formula Symbol	Description
r	After-Tax Weighted Average Cost of Capital (ATWACC)
s	Effective Tax Rate
B	Bonus Depreciation Percent
N	Cost Recovery Period (Years)
L	Lesser of N or 16 (Years)
m _j	Modified Accelerated Cost Recovery System (MACRS) depreciation factor for year j = 1, 2, ..., 16

The following assumptions are used in the calculation:

- Current federal tax and depreciation rates as established by U.S. Internal Revenue Service
- The state tax rate is an average of the income tax rates for all the states in the PJM Region
- 50 percent equity for the capital investment necessary to make a unit qualify for Black Start Service
- 50 percent debt for the capital investment necessary to make a unit qualify for Black Start Service
- Debt interest rate based on the most recent Net CONE quadrennial review after-tax weighted average cost of capital (ATWACC) and modified on annual basis by a 200 basis points or greater changes in the Moody Utility Index for bonds rated Baa1
 - This interest rate will be updated during the Net CONE quadrennial review
 - If the 2-year change in the Moody Utility Index for bonds rated Baa1 is more than 200 basis points, this change will be added to the interest rate used in the most recent Net CONE quadrennial review and used for the current year's interest rate
- Debt term equal to the recovery period
- Cost of equity equal to an after tax internal rate of return on equity of 12%

Values Utilized in Calculation of CRF for 2026/2027 Delivery Year

Federal Corporate Income Tax Rate	21.00%
State Tax Rate	6.14%
Percent Equity	50.00%
Percent Debt	50.00%
Cost of Equity	12.00%
Loan Term	Remaining Plant Life
Debt Rate	8.00%
Effective Tax Rate	25.85%

Further Information

Further information on the annual Capital Recovery Factor (CRF) for Black Start Units can be found in:

- PJM Open Access Transmission Tariff (OATT)
- PJM Manual 15

Example

- Unit entered Black Start Service on 06/01/2021. The age of the unit is 8 years old.
 - The unit would enter Black Start Service using a depreciation of 15 year MACRS (modified accelerated cost recovery system) and on the 0.1348 CRF rate. It would stay on this depreciation rate and CRF rate for the duration of the CRF recovery (next 15 years).
- Unit entered Black Start Service on 07/01/2021. The age of the unit is 30 years old.
 - On 07/01/21, the unit would enter Black Start Service using the 100% bonus depreciation and on the 0.250 CRF rate. It would stay on this depreciation rate for the duration of the CRF recovery. The unit's CRF rate would change each delivery year (June 1) as below.
 - On 06/01/22, the unit's CRF would change to 0.249 rate.
 - On 01/01/23, the unit's CRF would remain on the same rate of 0.249 rate (because the rate did not change).
 - On 06/01/23, the unit's CRF would change to 0.253 rate.
 - On 06/01/24, the unit's CRF would change to 0.249 rate.
 - On 06/01/25, the unit's CRF would remain on the same rate of 0.249 rate (because the rate did not change).
 - On 06/01/26, the unit's CRF would change to 0.250 rate.
- Unit entered Black Start Service on 08/20/2023. The age of the unit is 14 years old.
 - On 08/20/23, the unit would enter Black Start Service using the 80% bonus depreciation and on the 0.161 CRF rate. It would stay on this depreciation rate for the duration of the CRF recovery. The unit's CRF rate would change each delivery year (June 1) as below.
 - On 01/01/24, the unit's CRF would remain on the same rate of 0.161 rate (because the rate did not change).
 - On 06/01/24, the unit's CRF would change to 0.155 rate.
 - On 06/01/25, the unit's CRF would remain on the same rate of 0.155 rate (because the rate did not change).
 - On 06/01/26, the unit's CRF would change to 0.156 rate.
- Unit entered Black Start Service on 01/31/2024. The age of the unit is 2 years old.
 - On 01/31/24, the unit would enter Black Start Service using the 60% bonus depreciation and on the 0.117 CRF rate. It would stay on this depreciation rate for the duration of the CRF recovery. The unit's CRF rate would change each delivery year (June 1) as below.
 - On 06/01/24, the unit's CRF would change to 0.110 rate.
 - On 01/01/25, the unit's CRF would remain on the same rate of 0.110 rate (because the rate did not change).
 - On 06/01/25, the unit's CRF would remain on the same rate of 0.110 rate (because the rate did not change).
 - On 06/01/26, the unit's CRF would change to 0.112 rate.