RBC – PV Bias Producer v5.0

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Design Framework: DAI + RBC Framework v5.85 (October 2025)
Change Reference: Documentation – Detailed Design Creation (No behavioural change).

1. Functional Overview

Schedules the **PV Daily bias** update at 23:40 and delegates computation to the shared RBC Bias Blueprint script instance `script.rbc_update_bias_pv_daily`. If Home Assistant starts and today's period stamp is missing, performs a catch-up invocation. Writes are limited to helpers; no inverter commands are issued. Logbook entries record each execution path.

2. Entity Map

Entity ID / Var	Purpose	Direction
script.rbc_update_bias_pv_daily	RBC Bias Producer blueprint for PV Daily (robust EWMA)	Execute
input_number.rbc_bias_pv_daily	Stored PV Daily bias (kWh)	Write
input_text.rbc_last_period_pv	Last processed period key (YYYY-MM-DD)	Read
today_str = now().date()	Today's date string	Compute
last_period	Stored period stamp used to determine catch-up need	Read
already_done_today = (last_period == today_str)	Decides whether to run on HA start	Compute

3. Trigger Matrix

Trigger ID	Condition	Purpose
t_2340	Time = "23:40:00"	Primary nightly PV bias update
t_ha_start	Home Assistant Start	Catch-up if today not

stamped

4. Logic Flow

1. If trigger == t_2340:

2.   • Invoke script.rbc_update_bias_pv_daily.

3.   • Logbook: 'Triggered nightly PV Daily bias update for {{ today_str }}.'

4. Elif trigger == t_ha_start and not already_done_today:

5.   • Invoke script.rbc_update_bias_pv_daily.

6.   • Logbook: 'Catch-up run on HA start (no stamp for {{ today_str }}).'.

7. Else:

8.   • Logbook: 'Skipped: already stamped for {{ last_period }}; Trigger={{ trigger.id }}.'

5. Guards and Safety

• No inverter writes – blueprint updates helper(s) only.

• `mode: single` prevents overlapping bias updates.

• Catch-up path runs only when today's period stamp is missing to preserve idempotence.

• Visual-Editor-safe action calls (script.turn_on, logbook.log).

6. Scheduling

Primary schedule at 23:40 daily; HA-start catch-up executes only if today's period was not processed.

7. Acceptance Tests

Test ID	Scenario	Expected Result
T1	Normal nightly run	Blueprint script invoked; bias updated; logbook entry created.
T2	HA restart with missing stamp	Catch-up run executes and logs; bias updated.
T3	HA restart with stamp present	Default branch logs 'Skipped: already stamped...' and does not run

| T4 | Multiple rapid triggers | `mode: single` ensures only one execution at a time. |

8. Version Lineage & Governance

v5.0 – Schedules nightly update and adds HA-start catch-up based on period stamp; delegates bias maths to the PV Daily blueprint.

Governance: Protected Architecture Mode v5.9; Two-Phase Code-Change Gate v2.2. This document records the live YAML behaviour; no changes introduced.

9. YAML Reference (Read-Only Excerpt)

triggers: t_2340 @ "23:40:00", t_ha_start
vars: today_str, last_period, already_done_today
branches: nightly run → script.turn_on + log; HA-start catch-up if not stamped → script.turn_on + log; else → log skipped.

10. Compliance Checklist

✅ Entity ↔ ID alignment confirmed against live YAML: rbc_update_bias_pv_daily, rbc_bias_pv_daily, rbc_last_period_pv.

✅ Triggers have IDs; default logging path present.

✅ Visual-Editor-safe structure; no anchors/includes.

✅ No inverter writes; Master-only rule unaffected.

✅ Idempotent catch-up guarded by period-stamp logic.