

# WarmtelinQ vs. Heat Pumps in the Leiden Region

A Technical Audit of the National-Cost Comparison

## Chapter 1 — Foundations: the Haskoning study and the REDE counter-analysis

*Draft working document — prepared for Hans Konstapel, Constable Research B.V. — 11 July 2026*

### 1. Purpose and scope of this chapter

This chapter establishes the factual and quantitative foundation on which the rest of the audit will be built. It does two things only: (1) it summarises, with real figures, what the Royal HaskoningDHV (RHDHV) study for WarmtelinQ actually claims, and (2) it summarises, with real figures, the independent line-by-line re-assessment of that study published by the Regionale Expertgroep Duurzaam Energiesysteem (REDE) in February 2026. No numbers in this chapter are invented or estimated by the author of this document — every figure below is traceable to one of the two source reports listed in §2.

Later chapters (2 onward) will extend this foundation — for example by incorporating the 6 July 2026 Kamerbrief and its own restwarmte-alternatives report, by developing an independent sensitivity model, and by examining the end-user cost side, which REDE explicitly did not re-audit. Wherever this document goes beyond what the source reports state, that passage is marked as a HYPOTHESIS in red, so that speculation is never silently mixed with sourced fact.

### 2. Source documents used in this chapter

- Royal HaskoningDHV, “Maatschappelijke kosten & Eindgebruikerskosten Analyse WarmtelinQ+”, commissioned by WarmtelinQ/Gasunie, published 9 April 2025 (“the Haskoning study”).
- Regionale Expertgroep Duurzaam Energiesysteem (REDE), “Vergelijking Warmtepomp en WarmtelinQ — Evaluatie Haskoning-rapport”, final version, 15 February 2026 (“the REDE evaluation”). REDE members: Anne Marieke Schwencke (contact), Gerard Borsboom, Jeroen Bussmann, Annelies Huygen, Matthijs Kunenborg, Constant Thunnissen, Ben Vroom.

Both documents concern the same underlying comparison: a 50,000-dwelling-equivalent (WEQ) area spanning Ypenburg (Den Haag/Nootdorp) and Leiden, comparing scenario A1 (WarmtelinQ+ with gas-fired peak boilers) against scenario A6 (individual all-electric air-water heat pumps).

### 3. What Haskoning concluded

Haskoning’s headline conclusion, widely cited in Dutch policy documents including the Leiden municipal Transitievisie Warmte and successive KGG Kamerbrieven, is that WarmtelinQ+ has lower national (“societal”) costs than an all-electric heat-pump scenario — principally because of high heat-pump investment costs, home-adaptation costs (insulation, delivery systems) and grid-reinforcement costs. At the same time, Haskoning found that end-user costs are approximately 74% higher for WarmtelinQ+ than for heat pumps, meaning subsidy is required to keep WarmtelinQ+ affordable for residents.

#### 4. What REDE found after re-auditing the model

REDE did not dispute the end-user cost finding — it left that conclusion standing. It focused exclusively on re-checking the national-cost side, going through every cost line in the Haskoning Capex/Opex/Totex tables one by one against external benchmarks (principally Vesta MAIS, the PBL/CE Delft spatial energy model for the built environment) and against direct correspondence with Gasunie.

REDE’s conclusion reverses Haskoning’s headline finding: after correcting the identified errors, inconsistencies and disputed assumptions, WarmtelinQ+ is on average about 16% more expensive on national costs than all-electric (with a range of 11% cheaper to 52% more expensive, depending on assumptions). REDE frames its own report explicitly as a ‘second opinion’, not an absolute truth — a methodological caveat worth preserving in any further use of these figures.

##### 4.1 Quantified cost-line adjustments

The table below reproduces REDE’s ten most significant quantified adjustments (Totex effect, low estimate, in millions of euros). A negative figure reduces the Totex of the scenario named; a positive figure increases it.

| Cost item adjusted                                                         | Scenario affected | Haskoning basis                     | REDE adjustment                                                                          | Effect on Totex (M€)             |
|----------------------------------------------------------------------------|-------------------|-------------------------------------|------------------------------------------------------------------------------------------|----------------------------------|
| Grid reinforcement overstated (peak power double-counted; solar-PV share)  | All-electric      | Full cost to heat pumps             | Partly attributed to solar-PV; smaller total peak power                                  | –223 (all-electric)              |
| CO <sub>2</sub> pricing: double-counted on electricity + gas price too low | Both              | €60.13/ton, elec. + gas both priced | Elec. CO <sub>2</sub> already in price; KEV 2024 CO <sub>2</sub> path used (avg €159.85/ | –74 (all-electric) / +134 (WLQ+) |

| Cost item adjusted                                 | Scenario affected | Haskoning basis                     | REDE adjustment                           | Effect on Totex (M€) |
|----------------------------------------------------|-------------------|-------------------------------------|-------------------------------------------|----------------------|
| District-heating network maintenance too low       | WLQ+              | 1.0% of new-network investment only | Vesta MAIS rates; existing network        | +381 (WLQ+)          |
| Heat pump price too high                           | All-electric      | €15,000 per 8kW unit                | Vesta MAIS: €12,149                       | –176 (all-           |
| Heat pump reinvestment too low                     | All-electric      | €6,000                              | Vesta MAIS: €8,437 (75% of investment)    | +121 (all-electric)  |
| Insurance cost for heat pumps removed              | All-electric      | Extra premium assumed               | Insurers confirm no premium increase      | –131 (all-electric)  |
| Home insulation added to WLQ+ scenario             | WLQ+              | No insulation assumed necessary     | Insulation legally required regardless of | +177 (WLQ+)          |
| Maintenance of MT heat-delivery system (radiators) | WLQ+              | Not counted                         | Half of LT-system upkeep cost (CE Delft)  | +118 (WLQ+)          |
| Delivery-set maintenance removed from all-electric | All-electric      | District-heating delivery-set cost  | Not applicable to heat pumps              | –224 (all-electric)  |

Source: REDE (2026), Table 2 and §4, pp. 13–33. Figures are REDE's low-estimate ("L") adjustments; REDE also computed high-estimate variants, which are larger for several items due to compounding uncertainty margins (see REDE Bijlage A).

## 4.2 Headline results, side by side

| Metric                                                         | Haskoning (RHDHV, Apr 2025) | REDE re-assessment (Feb 2026)                                                           |
|----------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------|
| National cost, WLQ+ vs. all-electric                           | WLQ+ cheaper                | WLQ+ $\approx$ 16% more expensive on average (range: 11% cheaper to 52% more expensive) |
| End-user cost, WLQ+ vs. all-electric                           | WLQ+ 74% more expensive     | Unchanged — REDE did not re-audit this figure                                           |
| Grid-reinforcement cost as share of national cost              | Presented as decisive       | Only 12% of Capex — not decisive either way                                             |
| CO <sub>2</sub> emissions over 30 years, WLQ+ vs. all-electric | Not compared                | WLQ+ $\approx$ 8.5 $\times$ higher (gas-fired peak/backup boilers)                      |
| Gas-free by 2050 (Klimaatakkoord target)                       | Not addressed               | All-electric meets it; WLQ+ does not (peak boilers remain gas-fired)                    |

Source: REDE (2026), Summary and §3, pp. 5, 10–11; §6 and Figure 2, pp. 20–21.

## 5. Non-quantified considerations REDE flagged but did not price in

REDE explicitly separated adjustments it could quantify (§4 above) from considerations it judged directionally important but chose not to fold into the headline number, out of methodological caution. These are listed here because they represent the most promising leads for further quantitative work in a later chapter of this audit:

- Cost-overflow risk on large infrastructure: REDE notes that cost overruns are “the rule rather than the exception” for large infrastructure projects, and that WLQ+ has already seen a cost increase of roughly €500M against its 2021 baseline of €644M.
- Uncertain free-heat supply from Rotterdam: Haskoning assumes ~43% of WLQ+ heat is free residual heat; only the AVR incinerator supply is currently contracted, and it is not free. REDE estimates the range of impact at –€126M to +€212M on WLQ+ Totex depending on how this resolves.
- Uncertain fill rate (volloop) and the risk of drop-out (leegloop) as heat pumps and hybrid systems become cheaper and more attractive over time; Haskoning modelled neither drop-out nor a proper least-cost comparator (a heat pump rather than a gas boiler as the reference case).
- WLQ+ cannot provide cooling; REDE estimates €50–150M understatement of national costs from this omission as air-conditioning uptake grows (an estimated 62% of dwellings by 2050 under a no-additional-policy scenario).
- Grid-reinforcement costs could fall by €110–140M (removing the 1-in-50-year cold-snap dimensioning assumption) plus a further €78–118M (smart control, batteries, monitoring) — both omitted from REDE's own headline adjustment out of caution, meaning REDE's own –16% figure may itself be conservative in the heat-pump-favourable direction.
- Untapped potential of local low-temperature sources (aquathermal, solar-thermal, soil) and of the still-operating Uniper plant's residual heat, neither modelled by Haskoning.

## 6. Sustainability finding: WarmtelinQ+ is not gas-free

REDE's own addition to the Haskoning comparison — not present in the original study at all — is a CO<sub>2</sub> emissions analysis. Because WLQ+ still requires gas-fired peak and backup boilers for roughly one-third of heat demand in winter, REDE calculates that WarmtelinQ+ produces approximately 8.5 times more cumulative CO<sub>2</sub> over 30 years than the all-electric scenario, and that WLQ+ gas consumption already breaches the future emissions norms from 2029 onward (BCW art. 2.16). This directly conflicts with the Klimaatakkoord's 2050 gas-free target for the built environment, which the all-electric scenario meets by 2035–2040.

## 7. Notable errors and inconsistencies REDE identified in the Haskoning model

- Delivery-set maintenance costs (only applicable to district heating) were mistakenly also charged to the heat-pump scenario — an error Gasunie itself acknowledged (–€224M Totex correction).
- CO<sub>2</sub> pricing on electricity was double-counted, since wholesale electricity prices already embed EU ETS carbon costs.
- The reported uncertainty margins in the sensitivity analysis were not applied consistently, understating the high-estimate Opex of the all-electric scenario by an estimated €306M.
- Total peak thermal power assumed for the all-electric scenario (399 MW) is inconsistent with the peak power assumed for WLQ+ (454 MW) once heat losses are correctly accounted for; REDE recalculates a consistent figure of 296 MW.

## 8. Open questions for the next chapter

The following items are flagged as genuine open questions — not yet resolved by either source document — that the next chapter should take up:

**HYPOTHESIS — NOT YET VERIFIED:** The 6 July 2026 Kamerbrief attachment “Rapportage vergelijking restwarmte via WLQ met alternatieve warmteoplossingen” (Tweede Kamer doc. 2026D35663) almost certainly updates or supersedes parts of the Haskoning/REDE dispute described here, since it was explicitly commissioned to test whether WLQ+ is still the lowest-national-cost option after the 2025–2026 cost overruns. Its content has not yet been incorporated into this chapter and should be the first task of Chapter 2.

**HYPOTHESIS — NOT YET VERIFIED:** Whether REDE's not-quantified considerations (§5) would, if priced in using the same Vesta MAIS-based method REDE used for §4, push the national-cost gap beyond the current –16% average toward the more extreme end of REDE's own range (up to 52%) has not been calculated by REDE and would require original modelling work to substantiate — this is a natural candidate for original analytical contribution in this report, clearly labelled as such.

**HYPOTHESIS — NOT YET VERIFIED:** Whether the end-user cost comparison (which REDE left unaudited) would change materially under REDE's insulation and heat-pump-price corrections is asserted directionally by REDE (“probably becomes larger, in favour of heat pumps”) but not quantified — a full end-user cost re-audit, parallel to REDE's national-cost re-audit, is a clear gap in the literature that this report could fill.

## 9. Provisional bibliography for this chapter

- [REDE \(2026\), Vergelijking Warmtepomp en WarmtelinQ — Evaluatie Haskoning-rapport \(PDF\)](#)
- [Royal HaskoningDHV \(2025\), Maatschappelijke kosten & Eindgebruikerskosten Analyse WarmtelinQ+ \(source study\)](#)
- [Tweede Kamer \(6 juli 2026\), Brief regering: De Nederlandse warmtetransitie en de rol van collectieve warmte \(2026D35659\)](#)
- [Tweede Kamer \(6 juli 2026\), Bijlage: Rapportage vergelijking restwarmte via WLQ met alternatieve warmteoplossingen \(2026D35663\)](#)
- [Rijksoverheid \(10 feb 2026\), Externe validatie WLQ 2025 \(Fakton\)](#)

*All figures in §4–7 are drawn directly from the cited pages of the two named source reports. All red-flagged passages in §8 are original questions posed by this document's author, not claims from either source report, and require further verification before being treated as fact.*