ENERGY & UTILITIES · GUIDE

The skills matrix *for energy teams*

Energy and utilities face a quiet emergency: a wave of retirements is taking decades of irreplaceable knowledge out the door, just as the grid demands new digital and renewables skills. High-voltage know-how, switching sequences and plant experience often live in a few experienced heads and nowhere else. A skills matrix tracked over time turns that slow erosion into something you can see and act on, so cover is rebuilt before it is lost.

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Reading time 12 min · **Method** Upleashed 0 to 5 capability framework · **Updated** May 2026

THE SHORT ANSWER

An energy or utilities skills matrix maps the critical capabilities the operation depends on, high-voltage work, plant operations, SCADA, renewables, cyber, against who holds them and at what level, and tracks how that cover changes over time. Read the trend: which skills are eroding as people retire, and which need building. In short: **it makes the great crew change visible, showing capability declining on legacy skills and rising on new ones, so knowledge transfer and succession happen before critical cover walks out the door.**

KEY TAKEAWAYS

- **Knowledge is walking out.** A large share of the workforce is near retirement, taking institutional know-how with them.
- **Track the trend, not just today.** Cover on critical legacy skills erodes slowly; only a view over time reveals the decline in time to act.
- **Legacy down, digital up.** High-voltage and plant skills are thinning as SCADA, renewables and cyber skills must be built.
- **Transfer before they go.** Pair retiring experts with successors to capture tacit knowledge that lives nowhere else.
- **Plan succession on evidence.** The matrix shows exactly which critical skills need a successor, and how urgently.

START HERE

Knowledge that lives in *one head*

In energy and utilities, much of what keeps the lights on, switching sequences at a substation, the quirks of ageing plant, the workaround when SCADA misbehaves, lives in the heads of experienced people and, too often, nowhere else. As that generation retires, the knowledge goes with them. A skills matrix is the instrument that makes this **invisible asset visible**, mapping who holds each critical capability so it can be transferred before it is lost.

Map the critical capabilities

An energy matrix maps the **capabilities the operation depends on**: high-voltage and substation work, switching and isolation, plant and turbine operations, SCADA and control systems, and increasingly renewables, distributed energy and operational-technology cyber. Scored on a clear scale, it shows who is genuinely capable in each, and crucially how thinly some critical skills are held, often by a handful of veterans whose departure would leave a dangerous gap.

Track cover over time

What sets the energy challenge apart is that it is a **trend, not a snapshot**. Capability on legacy skills erodes gradually as people retire, and a single year's view hides it. Tracking the matrix over time turns that slow drain into a visible line: how many people were qualified on high-voltage work three

years ago, how many now, where the slope points. Seeing the direction of travel, declining here, building there, is what lets a utility act while there is still time, rather than discovering a gap when the last expert leaves.

Transfer knowledge and plan succession

Once the trends are visible, the matrix drives the two responses that matter: **knowledge transfer and succession**. It shows exactly which critical skills are thinning and who still holds them, so retiring experts can be paired with successors through mentoring while the knowledge is still in the building. And it grounds succession planning in evidence, revealing which critical capabilities lack a ready successor, so a utility can develop or recruit deliberately rather than reacting to each retirement as a fresh crisis.

WHY IT MATTERS NOW

The great *crew change*

A large share of the energy workforce is eligible to retire within a few years, at the very moment the grid is growing more complex and digital. A skills matrix tracked over time is how a utility sees the erosion coming and rebuilds cover before reliability is at risk.

~50%

VIA US DOL, CITED 2025

of the energy utility workforce is estimated to retire within ten years, taking deep expertise with them.

73%

FIELD SERVICE NEWS, VIA KAHUNA

of organisations see an ageing workforce as a threat to field service operations and continuity.

39%

WEF, 2025

of workers' core skills are expected to change by 2030, as the grid digitises and shifts to renewables.

This is not simply a labour shortage, it is a knowledge-transfer crisis arriving at the worst possible moment. Decades of tacit, safety-critical expertise are set to leave, while the operation simultaneously needs new digital, renewables and cyber capability it has historically not had. A skills matrix counters this by making **capability trends visible across the whole portfolio**: which legacy skills are eroding and how fast, where a critical capability rests on a few people near retirement, and where new skills are being built or still lacking. Seeing this lets a utility prioritise knowledge

transfer where the cliff is steepest, pair experts with successors before they go, target development and recruitment at the genuine gaps, and demonstrate to regulators and boards that the capability behind a reliable, evolving grid is being managed deliberately, not left to chance.

WHAT IT PROTECTS

Four things an energy matrix safeguards

In energy and utilities, a skills matrix protects four things that bear directly on reliability, safety and the transition ahead. Each follows from tracking capability against the operation's needs over time.

PROTECTS 01

Institutional knowledge

By showing who holds thinning critical skills, the matrix lets you capture tacit know-how through transfer before it retires out of the business.

PROTECTS 02

Reliability & safety

It reveals where safety-critical cover is eroding, so high-voltage, switching and plant capability is rebuilt before reliability is put at risk.

PROTECTS 03

The energy transition

It tracks the build-up of new skills, SCADA, renewables, cyber, so the workforce keeps pace with a digitising, decarbonising grid.

PROTECTS 04

Succession

It grounds succession planning in evidence, flagging critical capabilities without a ready successor so they are developed in good time.

The common thread is **continuity through a generational shift**. An energy operation cannot pause while it rebuilds capability; the grid must run safely throughout. Its know-how is distributed across legacy and emerging skills, concentrated in a workforce that is ageing even as the technology transforms. The matrix makes that whole picture visible and, crucially, shows its direction over time, so a utility can transfer knowledge before it is lost, keep safety-critical cover intact, build the new capabilities the transition demands, and plan succession on evidence rather than scrambling after each retirement.

THE SCALE BEHIND THE SCORES

The 0 to 5 capability framework

Tracking capability over time needs a consistent scale, so a score means the same thing each year and the trend is real. This framework, developed by Dr Alex J. Martin-Smith, provides it, with Level 3, works the capability unsupervised, as dependable cover, and Level 4, the experts and mentors whose retirement most threatens continuity.

0

Not required for the role EXCLUDED

The capability is not part of this role. Excluded from the score, keeping the matrix focused on the skills the operation genuinely depends on.

1

In training WEIGHTING 25%

Learning the capability under supervision. Up to 75% trained. The successors a utility must grow now to replace retiring expertise in time.

2

Developing WEIGHTING 50%

More than 75% trained; handles routine work alone, complex or hazardous tasks still need oversight. Developing cover, not yet a full replacement.

3

Capable WEIGHTING 75% · DEPENDABLE COVER

Works the capability unsupervised to standard. The level that counts as genuine cover, the point a successor reaches to truly replace a departing expert.

4

Subject Matter Expert / Mentor WEIGHTING 100%

Deep expertise; handles the hardest work and trains others. Often the veterans nearing retirement, the people whose tacit knowledge most needs transferring.

5

Strategic ownership / Authority WEIGHTING 100%

Sets standards and direction for a critical capability. The technical authority a utility must be sure it can replace as the generation turns over.

Watch the slope of each critical skill

Score each critical capability now, and re-score each year, counting the people at Level 3 or above. The **direction of travel** is the insight: a falling count on high-voltage or plant skills signals expertise retiring faster than it is replaced, a rising count on SCADA or renewables shows new capability building. A steep decline on a safety-critical skill with a Level 4 expert near retirement is the highest priority, that is where to focus knowledge transfer and succession before the cliff arrives.

A worked example. Two skills, opposite trends:

```
High-voltage / substation  9 → 8 → 7 → 5 over five years  →
eroding, act now
Renewables / DER  1 → 3 → 6 → 8  →  building well
the falling line is the one that threatens reliability.
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SEE THE TRENDS

Which skills are *eroding*

Here is the critical-skill portfolio as a set of trend lines: each row is a capability, and its sparkline shows how many people have been qualified in it over recent years. A line sloping down is cover eroding, usually to retirement; a line climbing is new capability building. The current count and direction sit alongside. In one view you can see where knowledge is draining away and where it is growing.

3 legacy skills

are sliding down: high-voltage, plant ops and switching, the safety-critical know-how most at risk of walking out the door

Illustrative operation on the Upleashed 0 to 5 framework. Each sparkline is the count qualified at Level 3+ over recent years; colour shows the direction.

WHAT THE OPERATIONS DIRECTOR READS HERE

- **The legacy skills are the priority.** High-voltage, plant operations and switching all slope downward, red and falling, as veterans retire. These are safety-critical, so knowledge transfer and successor development here cannot wait.
- **The new skills are building.** SCADA, renewables and cyber climb steadily, green and rising, evidence the transition workforce is forming. Worth confirming the build rate keeps pace with the grid's demands.
- **Watch the steepest decline.** High-voltage has fallen furthest and fastest. If its remaining cover sits with people near retirement, that is the single most urgent transfer to arrange this year.
- **One skill is flat.** Data and grid analytics is holding but not growing, a quiet gap given where the grid is heading. A candidate for deliberate development before it becomes a constraint.

READY-TO-USE EXAMPLES

Example skills to map for energy

An energy or utilities matrix should map the safety-critical operational skills and the emerging capabilities the transition demands. Here are

ready-to-adapt categories, a starting point to tailor to your operation.

Category	Examples to map (the columns)	Watch out for
Network & field	High-voltage, substation, switching and isolation, jointing, overhead lines	Safety-critical skills resting on a few near-retirement experts
Generation & plant	Plant and turbine operations, mechanical and electrical maintenance	Deep plant know-how undocumented and held in one or two heads
Control & digital	SCADA, control systems, GIS, grid analytics, automation	Assuming digital skills will appear without deliberate building
Transition	Renewables, distributed energy, storage, EV infrastructure	New capability lagging the pace of the energy transition
Safety & cyber	Safety rules and permits, environmental compliance, OT cyber security	OT cyber treated as IT's problem, not an operational skill

Map the capabilities your operation depends on, scored so Level 3 means someone works the skill unsupervised, and re-score over time so the trend on each is visible. Pay special attention to safety-critical skills held by few people near retirement, and to the emerging skills the transition requires. As always, map what matters most, keep the matrix current, and use the direction of travel to drive knowledge transfer, succession and targeted recruitment.

AVOID THESE

Six mistakes on an energy matrix

MISTAKE 01

A one-off snapshot

Erosion only shows over time. Re-score regularly so declining cover is caught while it can be fixed.

MISTAKE 02

Ignoring tacit knowledge

Switching quirks live in heads, not manuals. Capture and transfer them before the expert retires.

MISTAKE 03

Waiting for the retirement

Transfer takes time. Pair successors with experts well before the leaving date, not after.

MISTAKE 04

Neglecting new skills

The grid is digitising. Track SCADA, renewables and cyber building, not just legacy skills declining.

MISTAKE 05

Single-expert critical skills

One person on a safety-critical skill is acute risk. Build a successor before the cliff arrives.

MISTAKE 06

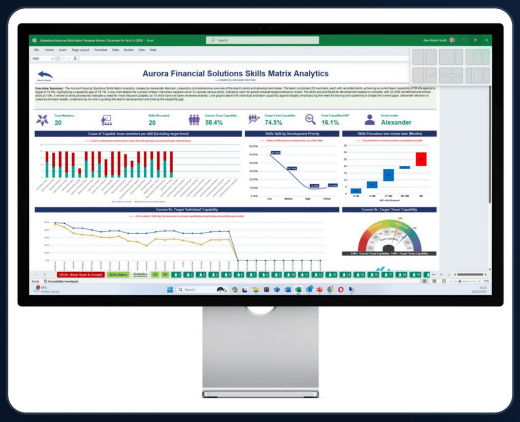
Succession by job title

A title is not capability. Plan succession on who can actually reach the level, evidenced by the matrix.

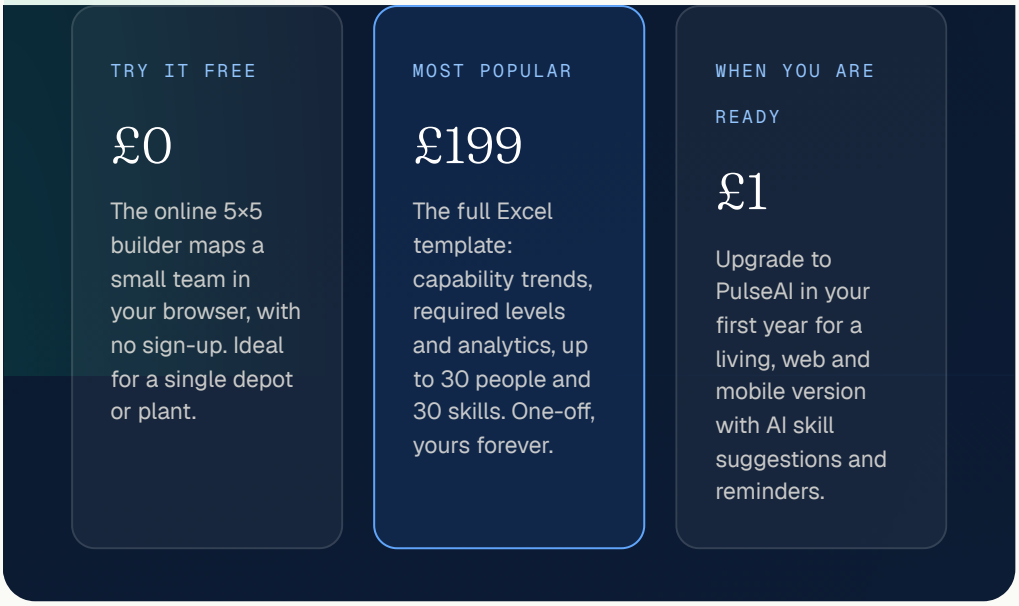
FROM KNOWLEDGE DRAIN TO MANAGED TRANSFER

The method is free. A ready-made matrix just makes the eroding skills and looming gaps *impossible to miss.*

Everything here works in a blank spreadsheet, and that is a fine place to start. A purpose-built template just makes the energy view effortless: score capability across the portfolio, re-score over time, and the trend on each critical skill is laid out for you, so the eroding legacy skills, the building digital ones and the critical capabilities without a successor stand out, giving you the evidence to drive knowledge transfer and succession before the crew change bites.



The Advanced Excel Skills Matrix tracks capability over time across the portfolio, the basis for spotting eroding skills, planning transfer and grounding succession, all on the same 0 to 5 framework used throughout this guide.



COMMON QUESTIONS

Quick *answers*

Q What is a skills matrix for energy and utilities?

It is a grid mapping the critical capabilities the operation depends on, high-voltage, plant operations, SCADA, renewables, cyber, against who holds each and at what level, tracked over time. Read as a trend, it shows which skills are eroding as people retire and which are building, so knowledge transfer and succession can be planned on evidence.

Q What is the great crew change?

It is the wave of retirements facing energy and utilities, with a large share of the workforce eligible to leave within a few years. The concern is not just headcount but the loss of deep, often undocumented expertise, switching sequences, plant quirks, high-voltage know-how, that lives in experienced heads and risks leaving with them.

Q Why track capability over time rather than once?

Because the erosion is gradual and a single snapshot hides it. Re-scoring each year reveals the direction of travel: a critical skill whose qualified count is falling signals expertise retiring faster than it is replaced. Seeing that slope early is what gives a utility time to transfer knowledge and build successors before a gap opens.

Q How does it help with knowledge transfer?

By showing exactly which critical skills are thinning and who still holds them. That lets a utility pair retiring experts with successors through mentoring while the knowledge is still in the building, capturing the tacit, hard-won expertise that documentation alone never fully holds, before it walks out the door for good.

Q How does it support the energy transition?

By tracking the build-up of new capabilities alongside the decline of legacy ones. As the grid digitises and shifts to renewables, the matrix shows whether SCADA, distributed-energy, analytics and cyber skills are growing fast enough to meet demand, so a utility can target development and recruitment where the new gaps are, not just defend the old skills.

Q Does this work for water, gas or smaller utilities?

Yes. The ageing-workforce and knowledge-transfer challenge runs across energy, water, gas and similar asset-intensive utilities, and the approach scales down to a single depot, plant or control room. Mapping the critical skills, tracking their trend, and acting on the decline works regardless of sector or size.

ABOUT THE AUTHOR

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Alex is the creator of the Upleashed capability framework that powers Skills Matrix Template, the award-winning Excel skills matrix. A Chartered Manager with an MBA, an LLM and a doctorate in business administration, he has spent more than two decades helping operations, HR and quality teams turn capability from a gut feel into something they can measure, manage and prove.

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Capture the knowledge *before it leaves.*

You now have the energy method. The quickest way to start is to list your critical skills, count who is qualified on each, and re-score next quarter to see the direction. The falling lines you find, especially safety-critical ones held by people near retirement, are exactly where knowledge transfer and succession need to start today.