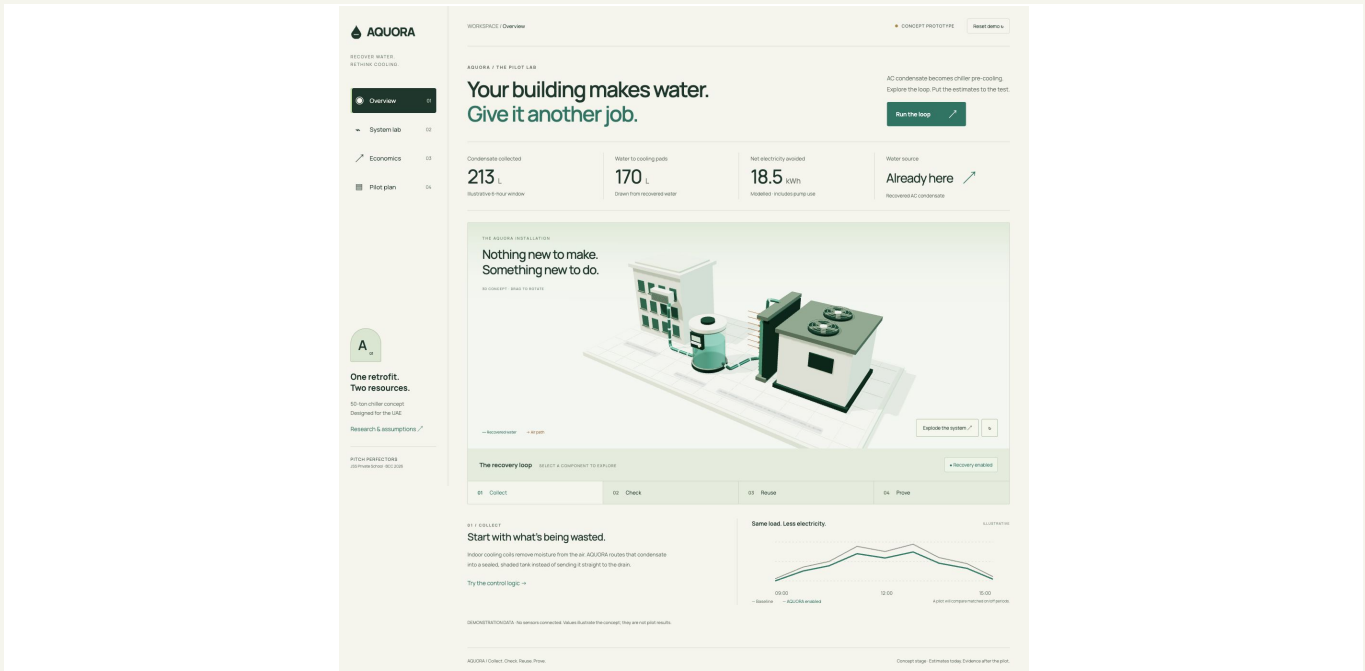


THE COMPLETE WALKTHROUGH

Know the prototype. Own the presentation.

A practical guide to the AQUORA Pilot Lab, its four tabs, the 3D installation, control logic, calculations and pilot proposal.



THE ONE-SENTENCE EXPLANATION

AQUORA proposes recovering AC condensate, checking conditions, and feeding it to evaporative pads that pre-cool the air entering an existing air-cooled chiller.

For the presenter: this is a working digital demonstrator. Its navigation, calculator, local form, 3D view and simulated controls work. The litres, kWh and temperatures are examples or model outputs; they do not come from installed hardware.

What to remember: water goes to the pads, not directly onto the coils. The eight-week pilot is intended to test water sufficiency, net energy benefit, safety and reliability. Success is not guaranteed.

Prototype: aquora-pilot-lab.pages.dev

01 / LIVE DEMO

A two-minute route through the story.

Time / screen	What to do	What to say
0:00-0:20 Overview	Start at default conditions. Point out the building, tank, pad and chiller.	"The building already makes condensate. We propose giving that water a second use."
0:20-0:40 Overview	Drag the model. Click Explode the system , then Assemble system . Select Collect, Check, Reuse and Prove.	"This is a concept layout. The water line feeds a separate pad; air then enters the existing chiller."
0:40-1:10 System lab	Simulate a leak. Clear it. Lower tank to 10%. Reset the demo.	"These controls demonstrate the proposed shut-offs. When a requirement fails, the pad feed stops."
1:10-1:35 Economics	Show 2.3 years. Move the saving slider from 6.5% toward 2%, then reset.	"Payback is sensitive to net saving, tariff and costs. The pilot must supply the evidence."
1:35-2:00 Pilot plan	Explain the four phases and all four pass marks.	"We need a suitable pilot building and a licensed HVAC partner to test this over eight weeks."

OPEN WITH THIS

"You are looking at our digital concept, not live building data. Let me show you the water route, when the controls stop it, and the assumptions behind the payback."

Before you present

Use a modern browser with WebGL enabled. Open the prototype and wait for the 3D model. Keep the PDF available as a backup. Use **Reset demo** to restore the baseline. If you previously saved a test site, use **Clear saved brief** on Pilot plan.

On a phone, the navigation uses icons: circle = Overview; flow symbol = System lab; diagonal arrow = Economics; document = Pilot plan. The active tab has a dark background.

02 / THE PHYSICAL IDEA

Know each object in the installation.

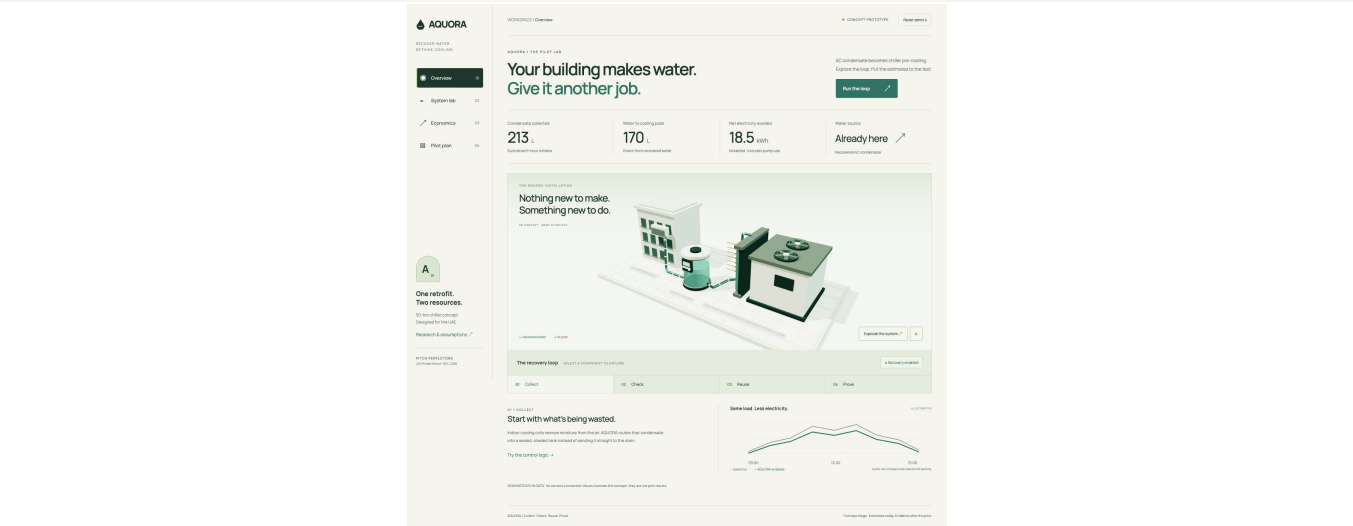
Part	Function in the proposed system	What the digital model does
Building / indoor cooling coils	Moist air condenses on indoor cooling coils. Drainage is routed toward the recovery tank. This source is distinct from the outdoor condenser.	The building and wall AC symbol identify the condensate source. The simplified building is not a real site.
Recovery pipework	Collect condensate and convey it to storage. Actual pipe routing, filtration, overflow and drainage require a site design.	Green pipe and moving beads show direction. Beads are animation, not measured flow.
Sealed, shaded tank	Store recovered water; limit contamination and solar exposure. Tank sizing and access require engineering.	The partly transparent cylinder shows a water level linked to the Tank level slider. Its display and LED are illustrative.
Checks, controller and pump	Proposed controller permits pad feed only under acceptable conditions. A pump may be required; its energy must be included in net savings.	The UI evaluates fixed demo rules. It sends no signal to a pump or real controller.
Evaporative intake pad	Water wets the pad. Some water evaporates, reducing air dry-bulb temperature before the air reaches the condenser.	The vertical finned panel is separate from the chiller. Air arrows show the conceptual airflow.
Existing air-cooled chiller	Rejects heat using outdoor air. The retrofit aims to improve inlet conditions while retaining the chiller.	The twin-fan unit represents existing equipment. Fan rotation does not predict energy use.
Meters and dashboard	A real pilot would meter condensate, pad use and electricity, with weather/load information for fair comparison.	The dashboard and forms demonstrate the reporting approach. No live sensor integrations exist.

The 3D view is explanatory: drag to orbit, click an object to select its description on Overview, separate the groups with Explode, and use the circular-arrow control to restore the camera. Exploding does not disconnect real equipment or change the calculations.

03 / OVERVIEW TAB

Tell the water story first.

The landing screen combines example indicators, a 3D concept installation, the four-step explanation and an illustrative electricity comparison.



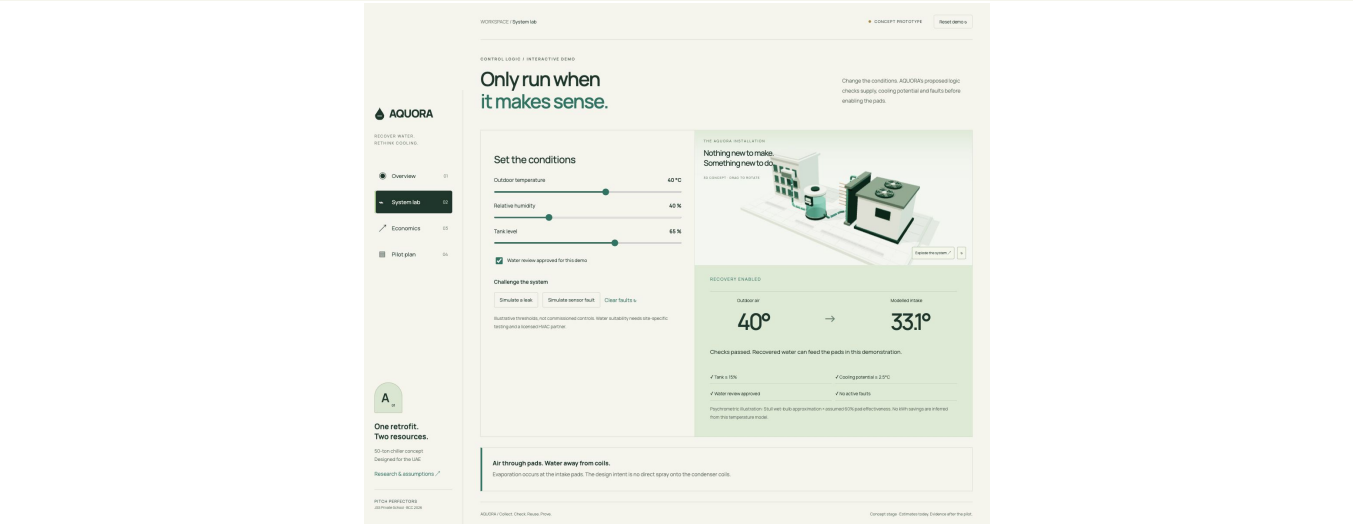
Displayed item	Meaning and presenter wording
213 L collected	A six-hour illustration: 50 tons x 0.71 L/ton-hour x 6 hours = 213 L . It is not a measured tank total or a site yield guarantee.
170 L to pads	An assumed demand in the same example window. It is fixed while operation is enabled; paused operation shows 0. The example leaves 43 L before any other losses, overflow or treatment needs.
18.5 kWh avoided	A fixed illustrative net energy indicator when enabled; it becomes 0.0 when paused. It is not computed from temperature or the Economics sliders and is not evidence of savings.
Already here	Identifies recovered condensate as the intended water source. No mains-water backup is simulated.

Run the loop starts a ~17-second guided 3D demonstration. It scrolls the model into view, focuses each component, highlights the active part and follows its water path. The tank fill is an illustrative animation. Stop, replay or select a component to take control. A failed check stops progression before pad feed. **Try the control logic** opens System lab.

The two-line chart: grey is the baseline illustration; green is the enabled illustration. The time labels cover 09:00-15:00. There is no calibrated kWh y-axis. Do not quote a saving percentage from the spacing between these lines.

04 / SYSTEM LAB TAB

Explain what enables the pad feed.



Control	Range / default	Effect
Outdoor temperature	28-48 C / 40 C	Feeds the temperature illustration. Demo operation also requires at least 30 C.
Relative humidity	20-90% / 40%	Changes the estimated wet-bulb temperature and evaporative cooling potential.
Tank level	0-100% / 65%	Changes the modelled tank fill. Below 15% pauses operation. Exactly 15% passes this check.
Water review approved	Checked by default	A manual demonstration permission flag. Unchecking pauses feed; it is not a lab certificate or water-quality measurement.
Leak / sensor fault	Off by default	Each button toggles a simulated fault. Either fault pauses pad feed. Clear faults resets both.

All requirements must pass: tank at least 15%; outdoor temperature at least 30 C; modelled cooling potential at least 2.5 C; water review checked; no leak; no sensor fault. The panel then reads **RECOVERY ENABLED**. Otherwise it reads **PAD OPERATION PAUSED**.

Green check rows summarize four checks. The “cooling potential” row combines both temperature and potential rules even though its short label mentions only 2.5 C. These are demonstration thresholds, not commissioned safety settings.

05 / FAULT DEMONSTRATION

Make a failure part of the pitch.

Scenario	Action	Expected behaviour
Leak	Click Simulate a leak .	Message says the pump is disabled and the fault needs inspection and clearing. Water beads stop. The status pauses. The outdoor chiller fan continues to turn in the model.
Sensor fault	Clear faults, then click Simulate sensor fault .	Message says valid readings must be restored. The digital model does not simulate specific sensor failure modes.
Low water	Clear faults. Set Tank level to 10% .	Message says low tank level; pump disabled. Lower water is visible in the 3D tank.
Water review pending	Reset. Uncheck Water review approved .	Message says pad feed is disabled while water review is pending.
Little evaporative benefit	Reset. Set humidity to 90% at 40 C.	Cooling potential falls below the demo threshold. The feed pauses. Higher humidity can increase condensate supply while reducing evaporation potential.
Low outdoor temperature	Reset. Set temperature to 28 C .	Operation pauses under the minimum-temperature rule even if some modelled cooling potential remains.

What changes when paused?

The recovery status turns amber; the tank LED changes colour; moving water beads disappear; the short intake display equals the outdoor temperature. Overview shows **0 L to pads** and **0.0 kWh avoided**. Collected water remains the fixed 213 L example. The physical chiller remains conceptually independent.

What reset actually does

Clear faults clears only leak and sensor flags. It does not refill the tank or approve water. **Reset demo** restores all sliders and permissions, clears faults, returns the loop explanation to Collect, and resets Economics. It preserves saved site information and planning checks. It does not reset the 3D camera or an exploded arrangement.

If several conditions fail, the message priority is: leak, sensor fault, water review, low water, then weather/potential. All pass/fail rows still update. The demo has no time delays, latching, hysteresis or manual restart sequence.

06 / COOLING MODEL

Temperature is a model. Energy is a separate question.

DEFAULT EXAMPLE

At 40 C outdoor temperature and 40% relative humidity, the prototype estimates an intake temperature of **33.1 C** when all conditions pass. The approximate reduction is 6.9 C. This is not a measured site result.

The calculation

The program uses the **Stull wet-bulb approximation** to estimate wet-bulb temperature from outdoor dry-bulb temperature and relative humidity. It then assumes **60% pad effectiveness**:

FORMULA

Cooling potential = $\max(0, \text{outdoor temperature} - \text{estimated wet-bulb temperature}) \times 0.60$

Modelled intake = outdoor temperature - cooling potential

If paused: modelled intake = outdoor temperature

For the default values, estimated wet-bulb temperature is about 28.6 C; 60% of the dry-/wet-bulb difference is about 6.9 C. The screen rounds the resulting intake temperature to one decimal place.

What this model does not include

It does not calculate airflow, pad pressure drop, fan response, chiller COP, refrigerant conditions, load, water evaporation rate, pump size, fouling or seasonal weather. Pad effectiveness is assumed constant. The demo does not solve a complete water-and-energy balance.

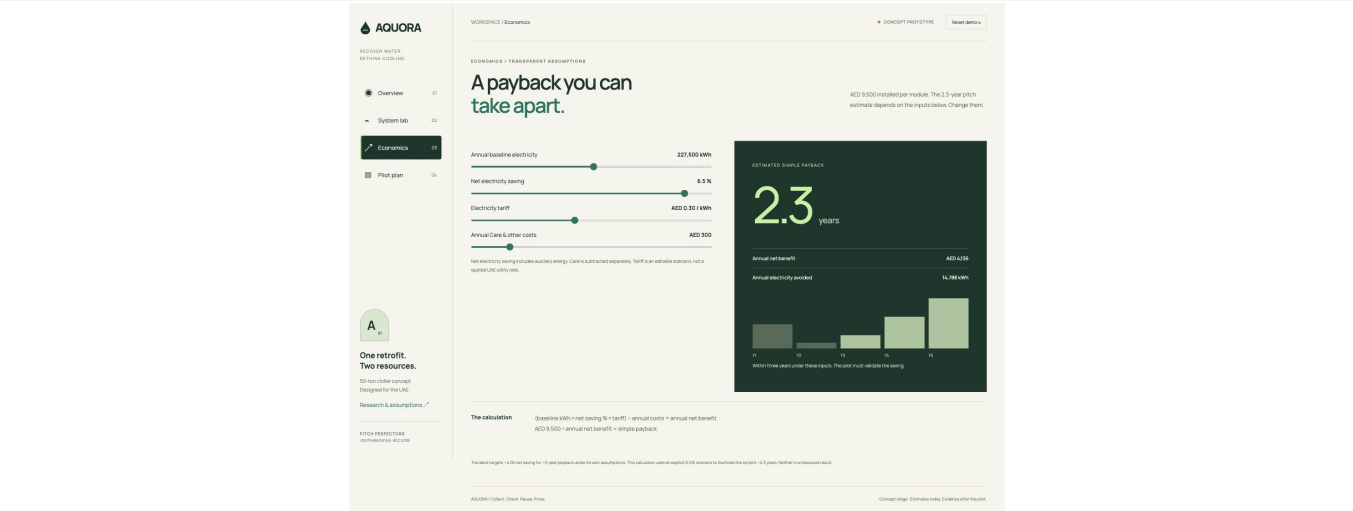
Avoid an easy presentation mistake

Do not say "6.9 C cooler means 6.5% energy saved." The prototype does not make that link. The **6.5% net saving** in Economics is an independent editable assumption. Real energy effects must be determined through a suitably controlled pilot.

The Stull formula is an approximation with a stated validity range in its original paper. The slider range includes hot conditions that approach or exceed that paper's common applicability range; treat these readings as teaching illustrations, not engineering predictions.

07 / ECONOMICS TAB

Make every dirham traceable.



Editable input	Range	Default
Annual baseline electricity	100,000-350,000 kWh; 2,500 steps	227,500 kWh/year
Net electricity saving	2.0-7.0%; 0.1-point steps	6.5%
Electricity tariff	AED 0.15-0.50/kWh; 0.01 steps	AED 0.30/kWh
Annual Care & other costs	AED 0-2,000; AED 50 steps	AED 300/year

The installed module price is fixed at **AED 9,500**. Net electricity saving is intended to include the module’s auxiliary energy; do not subtract pump electricity a second time. Care and other annual costs are deducted separately.

Default arithmetic: $227,500 \times 6.5\% = 14,787.5$ kWh/year avoided. At AED 0.30/kWh this is AED 4,436.25. Less AED 300 = **AED 4,136.25/year**. $\text{AED } 9,500 / \text{AED } 4,136.25 = \textbf{2.30 years}$. Displayed annual figures are rounded to whole units.

Five bars: year n shows n x annual net benefit - AED 9,500. Darker bars represent negative cumulative cash flow. Bar height is the absolute magnitude, not a signed axis. Hover for a value. No discounting, finance, tax, inflation or residual value is modelled.

08 / RECONCILE THE ESTIMATES

2.3 years and 3 years use different assumptions.

The user-supplied pitch script says about **2.3 years**. The deck says about **4.1% net saving for a three-year payback**. The prototype retains the script's figure through an explicit 6.5% scenario. It does not make these different cases appear identical.

Net saving input	Annual net benefit*	Simple payback*
2.0%	AED 1,065.00	8.92 years
4.1%	AED 2,498.25	3.80 years
6.5% (default)	AED 4,136.25	2.30 years
7.0%	AED 4,477.50	2.12 years

*All rows use 227,500 kWh/year baseline, AED 0.30/kWh and AED 300/year costs. Under these inputs, a three-year payback needs about **5.08% net saving**. The deck's 4.1% statement requires a different baseline, tariff or cost basis. Align those before an investor-facing claim.

RECOMMENDED ANSWER IF A JUDGE ASKS

“Our 2.3-year figure is a planning scenario. You can see every assumption here. The deck sets a three-year target using another set of assumptions; we need to reconcile that cost basis and then test the real site.”

Show a downside case

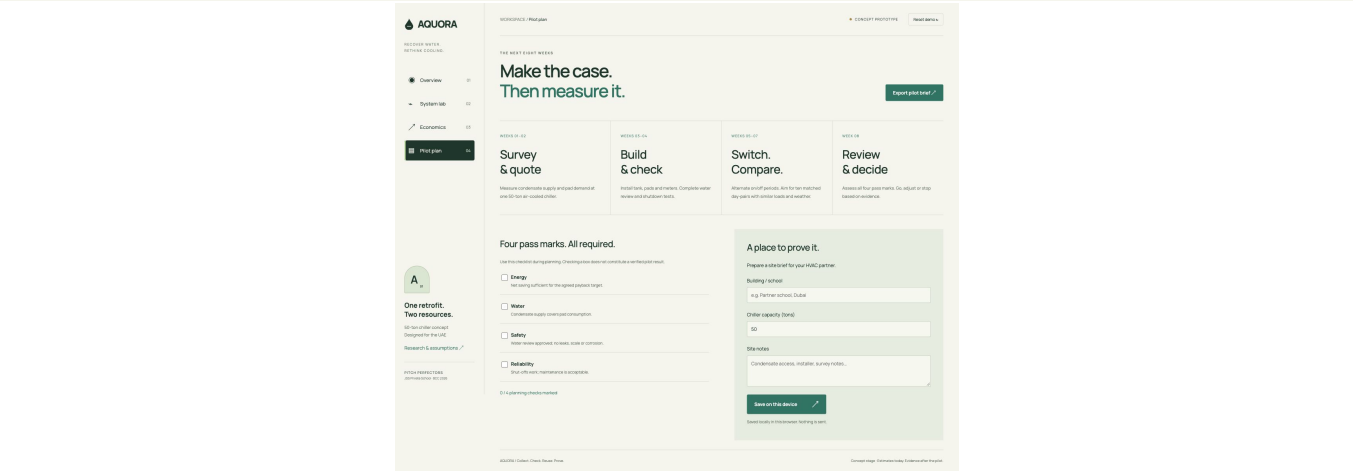
Reduce the saving input. Payback lengthens. For a clear no-payback example, set 100,000 kWh/year, 2%, AED 0.15/kWh and AED 2,000/year costs. The annual net benefit is **-AED 1,700**; the screen shows a dash and “no payback.”

Know what is excluded

There is no separate price for water savings, carbon benefit, financing, replacement parts beyond the annual cost input, capital contingency or varying annual operation. No current UAE tariff is claimed. Baseline and saving values must be replaced with defensible site evidence.

09 / PILOT PLAN TAB

Eight weeks to a decision, not a promise.



Phase	What needs to happen
Weeks 1-2 / Survey & quote	Confirm a suitable 50-ton air-cooled chiller, condensate access and safe pad installation. Measure supply and expected demand. Obtain an installer scope and quotes.
Weeks 3-4 / Build & check	Fit proposed tank, pad, pump/controls and measurement equipment. Conduct water review and shutdown tests before normal operation.
Weeks 5-7 / Switch. Compare.	Alternate enabled and disabled operation. Aim for ten matched day-pairs, with comparable weather and load. This is a target, not a completed dataset.
Week 8 / Review & decide	Compare results against the agreed pass marks. Decide go, adjust or stop. An eight-week pilot alone does not directly measure a full year of savings.

All four pass marks matter: Energy - sufficient net benefit for the agreed payback target; Water - supply covers pad use; Safety - approved water review and no leaks, scale or corrosion; Reliability - shut-offs and acceptable maintenance.

The checkboxes are a **planning checklist**. They update a 0/4 to 4/4 counter; checking them does not validate a result. The deck seeks a pilot site, a licensed HVAC partner and AED 60,000 proposed startup funding; none is stated as secured.

10 / FORMS AND GLOBAL CONTROLS

Know what is saved, and what is only shown.

Control / area	Exact behaviour
Building / school	Required text field, maximum 120 characters. This is a site brief, not a registration or request sent to a partner.
Chiller capacity (tons)	Required numeric field, range 1-5,000, default 50. Changing it does not recalculate Overview yield, System lab or Economics.
Site notes	Optional notes, maximum 2,000 characters. Avoid entering sensitive personal or building-security information during a public demo.
Save on this device	Browser validation runs first. Saves building, capacity, notes and currently marked planning checks under the local key aquora-pilot . The next page load restores them.
Clear saved brief	Removes the local saved record, resets the form and unchecks the planning checks. It does not reset the control or economic sliders.
Export pilot brief	Downloads AQUORA-pilot-brief.json . Includes current form data, checked planning marks, module price, eight-week phases, current economic inputs and concept-stage labels. No email is sent.
Reset demo	Restores all simulation and economic defaults and clears faults. It keeps the saved site brief. It does not submit or export anything.
Research & assumptions	Opens a modal with technical context, example assumptions and research links. Close with X, Escape or a click outside the panel. External sources open separately.
Presenter handbook	Opens this PDF. On narrow screens the desktop sidebar may be hidden; keep a local PDF copy available.
Navigation / URL hash	Four tabs are separate views of the same page: #overview, #system, #economics, #pilot. Slider state persists as you change tabs but resets on a full reload unless separately coded as saved site data.

Storage limit: localStorage belongs to that browser profile and that site origin. A brief saved on localhost will not automatically appear on the hosted site or another device. Private browsing or blocked storage can prevent persistence; use Export to keep a portable copy.

11 / JUDGE QUESTIONS

Clear answers without overclaiming.

Is this already collecting water?

No. This digital prototype illustrates the proposed equipment and logic. No sensors or real chiller are connected.

Is the water clean enough?

Not automatically. Condensate quality depends on collection surfaces, storage and contamination. Site-specific testing, suitable treatment and an approved operating plan are needed.

Do you spray the coils?

The design intent is water on separate intake pads. Air passes through those pads before reaching the condenser; there is no direct coil spray.

What happens if water runs out?

The proposed pad feed stops. The chiller remains the existing system. The demo stops at less than 15% tank level; the real setting needs commissioning.

Does UAE humidity help or hurt?

It can increase condensate production while reducing evaporative cooling potential. Supply and benefit must be measured together at the actual site.

Is this new physics?

No. Condensate reuse and evaporative pre-cooling have prior research. The proposed value is a packaged retrofit with controls and transparent measurement.

Is 213 L guaranteed?

No. It is a six-hour illustration based on a benchmark coefficient, not an AQUORA measurement. Site yield varies.

How much electricity will it save?

We do not yet know for a site. The prototype uses editable planning assumptions. The pilot must estimate net saving after auxiliary electricity.

Does 2.3 years prove the business case?

No. It follows from stated assumptions. At weaker saving or higher cost, payback can be much longer or absent.

Can eight weeks establish annual savings?

It can test feasibility and short-term performance. Annualization needs a justified method, seasonal weather/load data and uncertainty reporting.

What exactly do you need now?

One suitable pilot building, a licensed HVAC partner and funding for the proposed pilot and startup plan.

Will the pilot definitely prove success?

No. It may support, change or reject the case. Say “test” or “validate the estimate,” even though the pitch script uses “prove it.”

12 / EVIDENCE AND REHEARSAL

Separate proof from demonstration.

What has been checked digitally	What still needs physical validation
Navigation, component selection, 3D assemble/explode control and visible rendering.	Actual tank, pad, piping, mounting, pump, electrical integration, safe overflow and drainage.
Leak, sensor-fault, low-water, water-review and high-humidity pause logic.	Real sensors, fault coverage, fail-safe behaviour, commissioning and maintenance.
Default payback arithmetic and a no-payback scenario.	Metered baseline, matched energy data, tariff, auxiliary electricity and real annual costs.
Local form persistence and planning checklist behaviour.	No server-side project database, installer booking, partner submission or live dashboard exists.

The five claims to rehearse

1. Condensate is the proposed water source.
2. The pad cools incoming air; water is not sprayed directly on coils.
3. The controls shown are a proposed rule set.
4. Every displayed saving is illustrative or assumed until tested.
5. All four pilot pass marks are required for a go decision.

Research behind the explanation

Pre-cooling experiment: hot/humid performance and water consumption context. [pmc.ncbi.nlm.nih.gov/articles/PMC11811024](https://pubmed.ncbi.nlm.nih.gov/articles/PMC11811024)
UC Davis WCEC: evaporative condenser air pre-cooler evaluation. [WCEC final report](#)
Condensate study cited by the deck: [Sustainability 18\(16\), 8427 \(2026\)](#)
Wet-bulb approximation: Stull (2011), Journal of Applied Meteorology and Climatology, 50, 2267-2269. [DOI: 10.1175/JAMC-D-11-0143.1](#)
Primary project inputs: the supplied AQUORA_Finale_Pitch deck and the user-provided pitch script. Benchmarks from other equipment and climates do not establish AQUORA performance. Handbook descriptions match the accompanying prototype source as prepared on 23 October 2026.

CLOSE WITH THIS

“The prototype makes the idea testable. We are asking for a pilot site and an HVAC partner so we can replace these assumptions with site evidence.”