ARKHITEKTON
ENERGY
The Arkhitekts of Global Change

SMALL HYDRO · 250 KW TO 3 MW

Arkhitekton Energy Hydropower

Run-of-river, weir and mill-site hydro schemes that generate around the clock, with fish passage and river ecology designed in from the start. Fully funded, in a joint venture with the landowner.



24/7
predictable baseload power

40+ yrs
asset life

85%
of build funded by the EPC partner

£0
capital from the landowner

THE TECHNOLOGY

What a hydropower scheme looks like

The technology we fund, build and operate – and how a typical Arkhitekton Energy scheme is laid out on site.



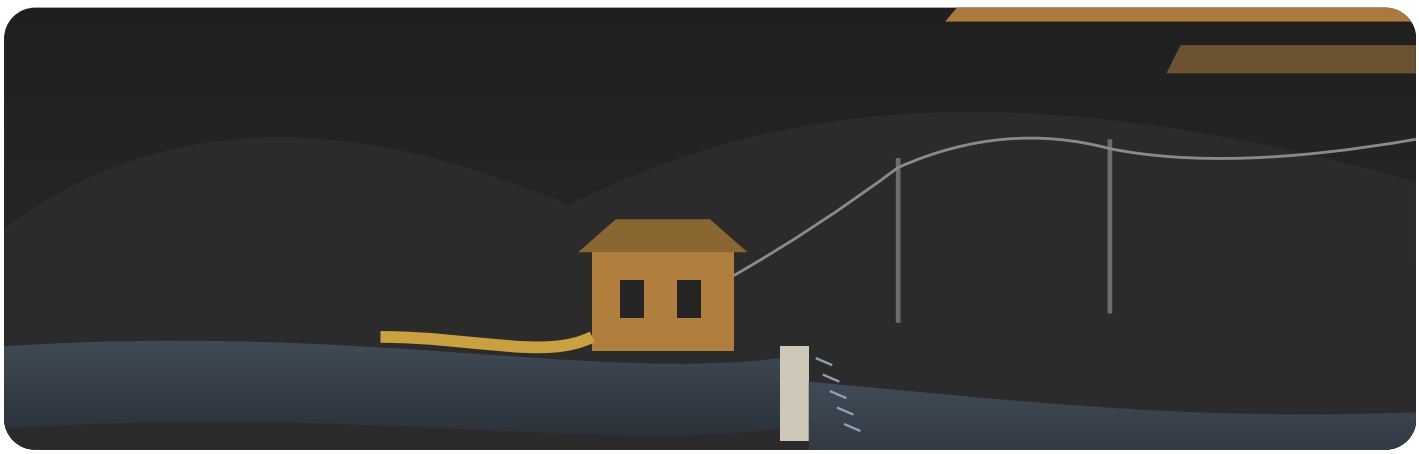
Historic turbine house beside a dam



Mill sluice and leat



Spillway gates at a hydro scheme



Typical hydropower scheme layout – Arkhitekton Energy illustration

WHY HYDRO, WHY NOW

The most reliable renewable on the river

Hydro generates day and night, so it is more predictable than wind or solar. Many UK weirs, mill leats and upland streams that once powered industry can be brought back into use with modern, fish-friendly turbines – and private-wire power to nearby users is worth far more than export.

40–50%
typical capacity factor

40+ yrs
civil works and turbine life with overhauls

~3,700
MWh a year per MW at 42%

24/7
generation, day and night

What makes the Arkhitekton approach different

- **Fully funded** – our EPC partner finances 85% of the build; the 15% balance is guaranteed
- **Joint venture with the landowner** – a 50/50 project company, land secured at Heads of Terms
- **Fixed-price turnkey EPC** with a UK Tier 1 civils partner and a full bond package
- **River-first design** – residual flows, fish passes and screening agreed with the regulator

Who it is for

- **Estates and farms** with weirs or upland streams
- **Owners of historic mills** and leats
- **Water utilities** with compensation flows
- **Communities** wanting local, reliable power

THE ARKHITEKTON FUNDING MODEL

85%
of the build financed by our EPC partner

15%
from a UK funding partner, guaranteed in full

50/50
joint venture with the landowner

£0
capital or borrowing for the landowner

For the landowner

Long-term, index-linked rent and half the profit – with no capital, no borrowing and no development risk.

For funders

Fixed-price EPC, URDG 758 guarantees, insurance and step-in rights – structured for institutional due diligence.

For offtakers

Round-the-clock renewable power by private wire or PPA – firmer than wind or solar.

Capacity factor and output are site-specific and confirmed by a flow study.

THE RANGE

Small hydro, matched to the river

The turbine is chosen for the head (height the water falls) and the flow. Schemes reuse existing weirs and leats wherever possible to keep the civil works light.

Scheme	Head	Capacity	Turbine	Typical site
Low-head weir	**1.5–5 m**	**250 kW–1 MW**	**Archimedes screw or Kaplan**	**Lowland rivers, mill weirs**
Run-of-river	5–30 m	500 kW–2 MW	Crossflow or Francis	Rivers with a natural drop
High-head upland	30–300 m	1–3 MW	Pelton or Turgo	Upland streams and burns
Reservoir outlet	10–50 m	250 kW–3 MW	Francis	Utility compensation flows

Inside every project

INTAKE

- Weir or intake structure
- Fish and eel screening
- Residual flow control

WATER PATH

- Leat, channel or buried pipe
- Turbine house
- Tailrace back to the river

TURBINE

- Fish-friendly screw options
- Generator and control panel
- Remote monitoring

ECOLOGY

- Fish pass
- Flow monitoring
- Habitat improvement

What a hydro scheme needs

1. **Flow study**
   Flow duration and head assessment.
2. **Licences**
   Abstraction and impoundment licences.
3. **Fish passage**
   Pass and screens agreed with the regulator.
4. **Planning**
   Planning permission and grid offer.
5. **Build**
   Intake, pipe or leat, turbine house.

SITING AND THE LANDOWNER

Reliable income from flowing water

The river keeps flowing as before – a share is borrowed, passed through the turbine and returned downstream. The landowner earns rent and a share of the profit for decades.

Weirs and mills

Existing weirs, mill races and leats that can be brought back into use.

Upland streams

Steep catchments with high head and reliable rainfall.

Near a power user

Farms, villages, distilleries or businesses that can take private-wire power.

What we look for

Criterion	What works	Why it matters
Head and flow	Enough for 250 kW upward	Sets the size and output of the scheme
Existing structures	Weir, leat or mill in place	Cuts civil works and consent risk
Ecology	Manageable fish and habitat issues	Licences depend on it
Grid or user	Local power user or grid capacity	Private wire earns the most
Access	Access for plant during the build	Construction and maintenance

The joint venture with the landowner

- **Heads of Terms early** – land secured by lease or purchase before the project is funded
- **50/50 project company** – the landowner and Arkhitekton Energy share net cash after costs, debt and tax
- **Water and land rent** of around 5% of revenue, index-linked
- **Restored structures** – weirs and leats repaired as part of the build

Planning and consents

- Abstraction licence for power generation
- Impoundment licence for any weir works
- Fish pass and screening approval
- Planning permission
- Network operator agreement or private-wire contract

FUNDING AND RETURNS

85% EPC finance, 15% equity, 50/50 with the landowner

The same funding model as every Arkhitekton Energy programme. Our EPC partner finances 85% of the project cost, repaid from project revenue. The remaining 15% is provided by a UK funding partner and covered in full by an advance payment guarantee.

Size	Project cost	EPC finance (85%)	Equity (15%)	Value to landowner a year	Landowner share, 30 yrs
250 kW	£1.0m	£0.8m	£0.1m	£14k	£1.9m
500 kW	£1.8m	£1.5m	£0.3m	£29k	£3.6m
1 MW	**£3.3m**	**£2.8m**	**£0.5m**	**£57k**	**£6.7m**
3 MW	£9.0m	£7.6m	£1.3m	£0.17m	£18.7m

1 MW – first full year of operation

£0.48m
revenue

£0.36m
EBITDA after operating costs and rent

£0.29m
EPC finance debt service

£67k
net cash, split 50/50

~24%
equity IRR, payback ~6 years

What the landowner receives

- **50%** of net distributable cash every quarter, open-book
- **£24k a year** water and land rent (about 5% of revenue), index-linked
- Cash share rises to about **£0.29m a year** on a 1 MW once the EPC loan is repaid
- **Local power** – private-wire supply to the landowner or neighbours below grid price
- No capital, no borrowing, no development risk for the landowner

Protections

- Fixed-price turnkey EPC with a UK Tier 1 civils partner
- **URDG 758** advance payment guarantee covering the 15% in full, plus performance (10%) and warranty (5%) guarantees
- Contractors' all-risks and third-party liability during the build
- Funders' step-in rights and a decommissioning reserve from year 10
- Option for the landowner to buy the plant at market value at the end of the term

Indicative base case: 42% capacity factor, private-wire or PPA price £120–150/MWh by size, operating costs 3% of capex a year, 30 years modelled of a 40-year-plus life. EPC finance 6% over 15 years; costs and revenue indexed at 2.5% a year. Subject to survey, planning, grid and offtake contracts.

EPC AND DELIVERY

Built turnkey, run by a UK operator

One fixed-price contract covers the intake, water path, turbine house, turbine and connection. Specialist UK hydro contractors deliver the river works alongside our EPC partner.

EPC partner

China Haisum Engineering, part of China Poly Group and our primary EPC partner, designs, procures, builds and commissions the plant on a fixed-price turnkey contract – and provides 85% of the project finance.

UK Tier 1 civils partner

Groundworks, foundations, access, drainage, HV works and grid connection, built to UK standards inside the EPC contract price.

UK operator

A UK operator monitors the scheme remotely, clears intake screens and runs planned overhauls, with flow records kept for the regulator.

How a site is delivered

1. **Survey** — Head, flow, structures and ecology screen.
2. **Contract** — Heads of Terms, JV and fixed-price EPC.
3. **Consent** — Flow study, licences and planning.
4. **Build** — River works in the low-flow season – about 6–12 months.
5. **Operate** — Power around the clock; income shared quarterly.

Performance guaranteed

- Turbine efficiency and output tested at commissioning
- Manufacturer warranties on turbine and generator
- Planned overhaul schedule for the full term
- Defined response times for faults and blockages

Reporting

- Live dashboards for the landowner, funders and offtakers
- Quarterly open-book management accounts for the project company
- Annual independent performance and ESG audit
- Lender-pack reporting to institutional standards

TYPICAL PROGRAMME

2–3 years including licences

From signed Heads of Terms. Grid connection dates are set by the network operator and can extend the programme.

NEXT STEPS

Bring your river back to work

Send us the location of the weir, mill or stream and any history of the site. We will come back with a head and flow screen and an indicative income range.

1

Site screen

Land, grid headroom, planning status and head, flow and existing structures.

2

Heads of Terms

Lease or purchase agreed and the joint venture with the landowner signed.

3

Pre-app and grid

Planning pre-application, permits and network operator connection offer.

4

Sign and close

EPC contract, funding and guarantees in place; build starts.

Who we are looking to hear from

- Estates and farms with weirs, leats or upland streams
- Owners of historic mills
- Water utilities with reservoir outlets
- Community groups wanting a local hydro scheme

Also from Arkhitekton Energy

- **UD Series** modular Data Centres, 250 kW to 2 MW
- **UE Series** gas turbine generators, 2 MW to 112 MW
- **Waste to energy** – CFH green methanol, plastic recycling and EfW
- Solar, battery storage, wind, floating solar, hydro, hydrogen, bioethanol and biomass

Talk to Arkhitekton Energy

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All figures are indicative and do not form an offer or a financial promotion. Projects are subject to survey, planning, grid connection, funder approval, contract and financial close.