Micro-Hydro Power Basics

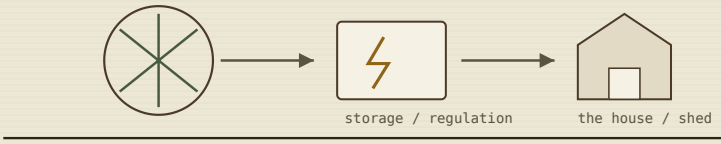
Turn a stream's flow and fall into continuous electricity

DIFFICULTY Hard
TYPE One-off installation, ongoing generation
TIME Weeks of assessment, days to install

DIFFICULTY	TIME	COST	BEST SEASON	FREQUENCY
Hard	Assessment + install	Moderate–high	Assess flow across seasons first	Continuous once running

01 Head and flow drive output

Micro-hydro output depends on two things: 'head' (the vertical drop available) and flow rate — a small, steep drop with steady flow can outperform a larger, flatter watercourse, and unlike solar, it can generate around the clock.



source — hydro, wind, or fuel

02 What you'll need

- A permanent, year-round watercourse with usable head and flow
- A turbine sized to your specific head/flow numbers
- Pipe (penstock) to deliver water to the turbine
- A charge controller and battery bank, or grid-interactive inverter
- Relevant water use approvals for your state

03 Method

- **1.** Measure available head (vertical drop) and flow rate across different seasons, not just at one point in time.
- **2.** Check water licensing requirements — extracting or diverting water from a natural watercourse is regulated in every Australian state.
- **3.** Select a turbine type matched to your head/flow profile (different turbines suit high-head/low-flow vs low-head/high-flow sites).
- **4.** Install the intake, penstock pipe, and turbine housing, positioning the turbine as low as practical to maximise head.
- **5.** Connect to a charge controller and battery bank, or a grid-interactive inverter, and commission the system.

04 Troubleshooting

- **Output lower than expected** — recheck actual head and flow measurements; losses in long or narrow penstock pipe reduce effective head.
- **Output drops in dry season** — flow-dependent generation varies seasonally; size the system around reliable low-flow output, not peak flow.
- **Debris blocking the intake** — fit and regularly clean an intake screen.
- **Water licensing issues after installation** — always confirm approvals before construction, not after; retrofitting compliance is far harder than starting compliant.

05 Timing & maintenance

BEST TIME	Assess flow across at least a full year before committing to a system size.
DURATION	A properly sized system generates continuously, day and night, unlike solar.
MAINTENANCE	Regular intake screen cleaning; periodic turbine and pipe inspection.
SIGNS OF SUCCESS	Consistent power output tracking your measured flow, with no unexplained drop-offs.

06 Tips & variations

PAIRS WELL WITH

Backup Generators

COMMON MISTAKES

- Sizing the system around peak flow rather than reliable low-flow conditions
- Proceeding without checking water use licensing requirements first

PRO TIP

Micro-hydro's constant, 24-hour output makes it a genuinely different proposition to solar — even a modest system can outperform a much larger solar array in total daily energy if you have reliable year-round flow.