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ENVIRONMENT · CARBON · PUBLIC AFFAIRS
NORTHERN IRELAND

The Irish Sea: nuclear, fish and power

What Sellafield has left in the water, what is safe to eat, what really gives Northern Ireland its radiation dose, and whether a small nuclear reactor has any place here.

A briefing for MLAs, councils and trade bodies in Northern Ireland · 27 November 2026

robertjpark.co.uk

IN TWO PAGES

Small dose from the sea, bigger questions on land

Sellafield's mark on the Irish Sea is real and measured, and today it is small. The larger radiation dose in Northern Ireland comes out of the ground as radon. A small reactor would be low-carbon but, for now, has no published price and no UK disposal route, and the full-size design fits Northern Ireland's grid badly.

7 µSv
a year to NI seafood eaters from Sellafield: under 1% of the public limit (2025)

1,300 µSv
a year to the average UK resident from radon

£63m
of fish landed by NI vessels in 2024; half of it shellfish

42%
of NI's electricity (8,865 GWh, year to June 2026) is what one Rolls-Royce reactor would make

£136bn
forecast cost of cleaning up Sellafield, to 2125

−35%
cut in catch advice for Irish Sea Dublin Bay prawns, 2026

9.1p
per kWh: new offshore wind contracts. Large nuclear: 12.9p–15.5p

0
prices published for a Rolls-Royce small reactor

What the evidence says

- **The sea.** Doses from Sellafield have fallen about tenfold since the 1980s. The open risks are the old waste stores, a leaking silo and an accident, not routine discharges.
- **Food.** Fish and dulse remain good food. The limits that matter are mercury in imported big fish and iodine in seaweed.
- **The ground.** Radon is estimated to cause about 30 lung cancer deaths a year in NI, mostly among people who smoke cigarettes.
- **Power.** New wind and solar are the cheapest contracts on offer. Nuclear gives firm power whatever the weather, at a higher and less certain price.

Recommendations

- Publish one NI seafood and seaweed data summary each year.
- Enforce radon duties and add a radon test to home sales in affected areas.
- Ask the Assembly to revisit its 2007 position on Sellafield.
- Plan now for small and advanced modular reactors, north and south, and commit when clear triggers are met.
- Build grid, storage, renewables, biomethane and heat networks now.
- Manufacturers: plan your 2027 imports before the UK carbon border charge starts on 1 January 2027.

How to read the charts. Red marks Northern Ireland, nuclear, or the point a chart is making. Black and grey are for comparison. Chart titles state the finding; the caption under each gives the source and date. Dose figures compare amounts of radiation; on their own they are not a judgement that any source is safe or unsafe.

Our view, and what each reader can do

Our view: plan and champion modular reactors, north and south

Northern Ireland and the Republic should plan for, and champion, small and advanced modular reactors (SMRs and AMRs) as part of one energy policy built on security, interdependence, independence and storage. That policy should run hand in hand with biomethane and with new technologies such as transparent solar PV. The price, waste and grid questions in sections 10, 11 and 14 are the triggers that turn planning into commitment.

MLAs and the Executive

- Revisit the Assembly's 2007 position on Sellafield and take evidence on reactors before May 2027.
- Commission the grid study, siting screen and skills audit now (option C, section 14).
- Settle who decides: London and Stormont each point to the other.

District councils

- Use radon data in housing and planning work; promote home tests in affected areas.
- Respond to the Wylfa consultations, which are open to anyone wherever they live, and ask Dublin to use its notification rights under the Espoo convention.

Trade bodies and manufacturers

- Plan 2027 imports of iron and steel, aluminium, cement, fertiliser and hydrogen before UK CBAM starts on 1 January 2027.
- Press for a register of NI firms able to supply nuclear work: up to £1.4bn of reactor contracts are opening.

Householders and anglers

- Keep eating fish: two portions a week, one oily. Go easy on kelp; dulse in moderation.
- Check the radon map, test, and fix if needed. Not smoking cigarettes matters most.

Reading the units (more in section 9)

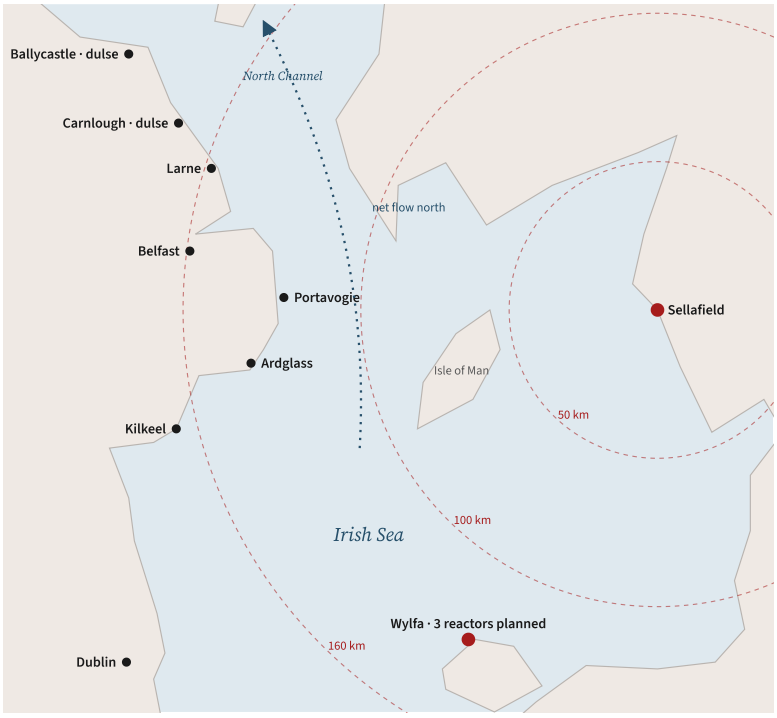
Unit	Plain meaning	An example, for scale
kWh	The unit on your electricity bill	An NI home uses about 3,200 a year (3,179 in 2024)
MWh, GWh, TWh	Thousand, million, billion kWh	1 GWh runs about 315 homes for a year
£/MWh and p/kWh	The same price twice: divide £/MWh by 10	£91/MWh = 9.1p/kWh. NI homes paid 30.6p in late 2025, because bills add networks and levies
MW	How fast power is made or used	A kettle is 3 kW; NI's peak demand is 1,520 MW
µSv	Microsievert: a measure of radiation dose	A chest X-ray is 14; the public limit for man-made sources, excluding medical, is 1,000 a year
Bq	Becquerel: how radioactive something is. One Bq is one atom decaying each second	Usually given per kilogram or per cubic metre: seaweed at Ardglass reads 23 Bq/kg of technetium-99; the air in an average NI home holds 19 Bq/m^3 of radon

Not legal, tax, customs or medical advice. Figures checked to 27 November 2026; anything still an estimate is labelled where it appears.

A £63 million fishery whose main worry is the stock

Northern Ireland's fleet landed 50,821 tonnes worth £63.1 million in 2024. Almost all of the value is shellfish and oily fish; white fish is now under 2%.

Larne is about 160 km from Sellafield; the Isle of Man a third of that

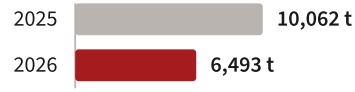


Schematic map; rings show straight-line distance from Sellafield. The sea is a working route too: the author's father, Captain J. P. Park RNR, Master Mariner, led the ships from Larne to Fleetwood before he retired.

Stocks, not Sellafield

The scientific advice for western Irish Sea Dublin Bay prawns for 2026 was 6,493 tonnes, down 35% (ICES advice; the catch limit set may differ), with the stock below the level at which ICES cuts its advice. The advice for Irish Sea cod is zero catch in 2027 and 2028.

Prawn catch advice cut by a third for 2026

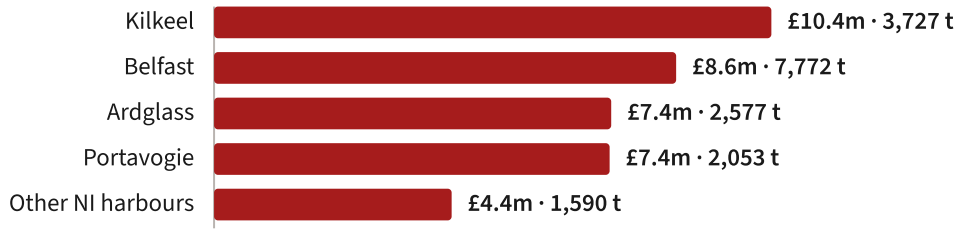


Tonnes, western Irish Sea. Source: ICES.

Wind farms and fishing grounds

A study for DAERA (July 2026) puts landings from the candidate floating-wind area at £5.45m a year, and warns of a 37–46% loss in fleet indicators if every floating site were built.

Kilkeel lands the most value; Belfast the most weight, almost all herring and mackerel (2025)

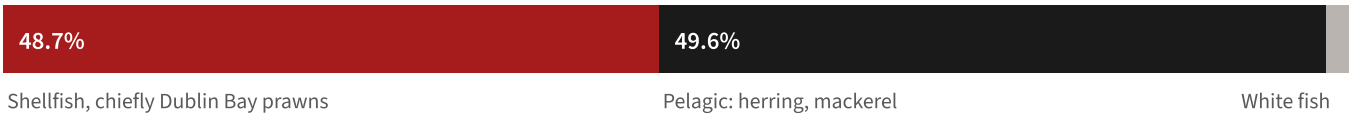


Landings into NI ports by UK vessels, 2025: 17,720 tonnes worth £38.1 million, up from £27.6m in 2021. Source: Marine Management Organisation, UK Sea Fisheries Statistics 2025, Table 2.13d (29 October 2026). NI boats also land a large share of their catch outside NI, so these figures are smaller than the £63.1m caught.



A fishing boat on the River Foyle, Derry. Photo: K. Mitch Hodge · Unsplash

Shellfish and pelagic fish make 98% of the value NI vessels land, 2024



Share of landed value. Source: DAERA figures as published by NI Assembly Research (2026). “Dublin Bay prawns” are *Nephrops norvegicus*.

Has a scare ever cost sales?

A 1983 parliamentary answer records Cumbrian fishermen struggling to sell fish after Sellafield publicity. No costed scare has been found for NI. Reputation is still the asset to protect, which is why local data matters.

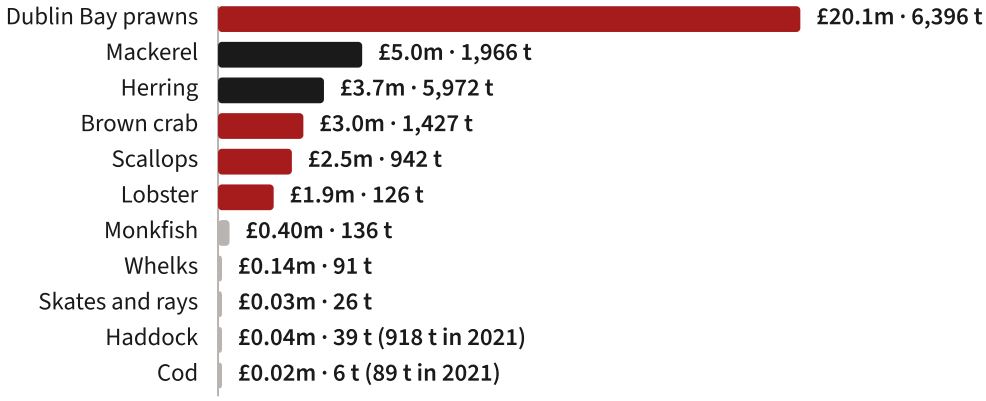
2,059
people in NI sea fishing (DAERA; year not stated)

€396m
landed in ports in the Republic by all vessels, 2023 (CSO)

Prawns pay the bills; we export the best and eat too little of it

Dublin Bay prawns are over half of the value landed into Northern Ireland. Herring and mackerel are the weight. Cod and haddock have almost gone from NI ports in five years.

Dublin Bay prawns earn £20.1m of the £38.1m landed into NI ports (2025)



Value and weight landed into NI ports by UK vessels, 2025. Red = shellfish. Source: MMO, Table 2.2d and 2.13d.

The price of fish

What a boat is paid at the quay, 2025, worked out from the MMO's NI port figures:

Species	£ per kg at the quay
Lobster	£15.24
Sole	£8.30
Turbot	£7.98
Dublin Bay prawns	£3.15
Monkfish	£2.95
Scallops	£2.71
Mackerel	£2.53
Brown crab	£2.07
Skates and rays	£1.10
Herring	£0.61

Shop prices are several times higher: they add processing, transport, waste and retail margin. Across the UK the average quay price of all fish rose from £908 a tonne in 2000 to £2,222 in 2025 (MMO Table 2.16).

Where it goes

In 2022 NI fish processors sold £69.9m: 37% to Great Britain, 28% to other EU countries, 11% to the Republic and only 21% in NI itself (DAERA, as set out in Caught here, landed elsewhere). Whole prawns, crab and live shellfish go straight to Spain, France and Italy.

The UK as a whole exported 368,000 tonnes of fish worth £1.99bn in 2025 and imported 641,000 tonnes worth £3.74bn; the EU took two-thirds of the exports by weight, France most of all (MMO trade tables). NI figures are not published separately.

Farmed as well as wild

NI aquaculture was worth £14.0m in 2022: £8.1m shellfish and £5.9m finfish, with 141 jobs (Assembly Research, June 2025, from DAERA data). The main farmed shellfish are blue mussels, Pacific oysters and some king scallops (AFBI); salmon and trout are the finfish. The industry's own group puts output at about 1,400 tonnes of oysters, 1,300 of mussels and 1,100 of finfish (Fishmongers' Company, 2024; secondary source). No wild mussels or oysters were landed into

What we eat, and what we should eat more of

NI adults eat 30–60 g of oily fish a week against the 140 g advised; children 7–15 g (FSA diet survey, 2012/13 to 2016/17). We land mackerel and herring by the thousand tonnes and send most of it away. The case for eating more of our own:

- **Herring, above all:** gorgeous, healthy and the cheapest fish we land, at about 61p a kilo at the quay. Mackerel too: both oily, rich in omega-3 and vitamin D.
- **Mussels:** farmed here, about 0.11 kg CO_2e per kg, against 0.23 for mackerel and 1.5–2.9 for trawled prawns and white fish (BIM's 2023 estimate; other studies find more for trawled prawns).
- **Crab:** local, plentiful and far cheaper than lobster.

NI ports in 2025: almost all NI mussels and oysters are farmed, apart from the wild native oyster fishery in Lough Foyle, managed by the Loughs Agency.



Fresh fish and Dublin Bay prawns on ice. Photo: Alessandro Rossi · Unsplash

Fish on Fridays, and in Lent

Catholic Church law makes every Friday a day of penance. Canon 1251 asks for abstinence from meat, or another food set by the bishops, on Fridays unless a solemnity falls, and for fasting and abstinence on Ash Wednesday and Good Friday (Code of Canon Law). The Church never required fish: abstinence means giving up meat, and fish became the custom (Bishops of England and Wales). The Irish bishops set the local rule for the whole island.

A personal word: Robert J. Park is a Catholic, and Friday fish is one of the nicer habits his faith has handed down. It is an invitation, not a rule, and it is open to everyone, of any faith or none. Start with herring: gorgeous, good for you and about 61p a kilo at the quay.

Bivalves, crabs, lobsters, prawns and rays

Shellfish were three-quarters of the value landed into NI ports in 2025. They differ in how they feed, how they are caught or farmed, and what they take up from the water.

Bivalves: oysters, mussels, scallops, cockles

Bivalves have two hinged shells and feed by filtering seawater. That is why they are good for the water and why they need watching: they concentrate what the water carries, from algal toxins and norovirus to radionuclides such as technetium-99. The FSA classifies harvesting beds; shellfish from class B beds must be purified, relaid or cooked before sale.

- **Oysters:** farmed Pacific oysters in the sea loughs. Raw oysters carry a norovirus risk: older people, pregnant women, young children and anyone with weak immunity should avoid them.
- **Mussels:** rope and bottom-grown; among the lowest-carbon animal proteins there are.
- **Scallops:** mostly dredged; 942 t landed in 2025, worth £2.5m.



Oysters on ice. Photo: Cathrine Skovly · Unsplash

Crabs and lobsters

Caught in pots by small inshore boats. More than half of the crab and lobster landed in 2025 came into the smaller NI harbours, not the big three. Lobster is the most valuable catch per kilo, at £15.24; brown crab sells for £2.07.

Dublin Bay prawns

Dublin Bay prawns (*Nephrops norvegicus*) live in burrows in the western Irish Sea mud. They earned £20.1m in 2025, the largest single catch, but the 2026 scientific advice is down 35% (section 1). Whole prawns earn far more than tails.

Skates and rays

Landings fell from 97 t in 2021 to 26 t in 2025, worth about £28,000. Rays grow slowly and breed late, so they are easily overfished.

What they take up

Lobster at Kilkeel reads 4.9 Bq/kg of technetium-99 from Sellafield (RIFE 31; see section 6): a trace. Mercury builds up in large predatory fish, far less in shellfish (section 6).

Sea urchins: our own work, a delicacy, and a species to protect

Sea urchins are not shellfish but echinoderms, cousins of the starfish, Each skeletal plate is a single crystal of calcite full of pores. At Queen Mary University of London, Robert J. Park and Professor Fiona Meldrum cast urchin plates in polymer and grew single crystals in the urchin's shape (Advanced Materials, 2002; Journal of Materials Chemistry, 2004; more in Crystals in Confinement). In the lab we spawned urchins on demand: a little 0.5 M potassium chloride injected around the mouth, and within minutes they release eggs or sperm (standard method). It is the same trick hatcheries use to raise urchins for farming.

Then and now. The question behind that work, how pores control what ions and crystals do, now sits at the heart of energy storage. Supercapacitors store charge as ions packed into porous carbon electrodes, and a 2006 study in Science found pores smaller than the ions' usual size still stored charge, overturning a long-held rule; how large the effect is remains debated. Porous materials that hold ions are part of the storage our energy view depends on.

On the plate. The roe is the treat: *uni* in Japanese sushi, rich, sweet and tasting of the sea, and in Spain *erizos de mar*, eaten raw, in scrambled eggs or with pasta. Per 100 g of raw roe, a study of two species found about 14 g protein, 6–7 g fat, 2–4 g carbohydrate and 100–150 kcal (Separations, 2021); the roe also carries omega-3 fats, vitamins A and E, iron, magnesium and zinc (review, 2025).

What they take up. Mostly natural radioactivity: urchins sampled in the Balearic Islands held polonium-210 at 38–325 Bq/kg and potassium-40 at 220–996 Bq/kg, dry weight, with strontium-90 also measured (Seville study, 2023). After Fukushima, urchins took up caesium-137 (PLOS ONE, 2022). We have found no NI or Irish Sea measurements.

Why many are protected. Urchins are key grazers of kelp and seagrass, grow slowly and are easily overharvested; where harvested, closed seasons, size limits and protected areas keep stocks from collapse (Mediterranean study, 2022). In Ireland the purple urchin has collapsed at Lough Hyne, Europe's first marine reserve, with over-harvesting and poaching among the suspected causes (UCC, 2019). Check local rules before gathering any.



A sea urchin (*Echinometra mathaei*). Photo: NOAA · Unsplash

The Windsor Framework draws fish, nuclear and carbon borders

Northern Ireland follows EU food law and some EU nuclear-shipment law; Great Britain does not. Fish and radioactive material therefore cross a regulatory line in the Irish Sea that most other goods do not.

The fish border

- **NI to the EU:** fish landed in NI moves to the EU with no illegal-fishing catch certificate, and to GB with nothing extra.
- **GB to NI:** fish moving outside the NI Retail Movement Scheme needs an export health certificate and a catch certificate through an NI point of entry (DAERA).
- **The SPS deal:** concluded on 20 November 2026, intended to start on 1 March 2028; not yet signed or law. Routine checks on GB fish are expected to go; catch-certificate arrangements for GB to NI are still being negotiated (GOV.UK, 1 June 2026; see The SPS deal).

The nuclear border

- Under Annex 2 of the Windsor Framework, Directive 2006/117/Euratom on shipments of radioactive waste and spent fuel still applies in NI, with references to Member States read as including NI (UK radioactive substances framework, December 2021).
- So radioactive waste or spent fuel moving between NI and the Republic follows the EU system. How a shipment from an NI reactor to a GB store would be treated is a legal question to settle before any NI reactor is planned.
- Nuclear energy policy stays excepted, at Westminster (section 13). Electricity trades in the all-island market under the Windsor Framework.

So an NI reactor would sit under UK nuclear law, an all-island power market and, for waste shipments, EU rules.

A third border: carbon, for manufacturers

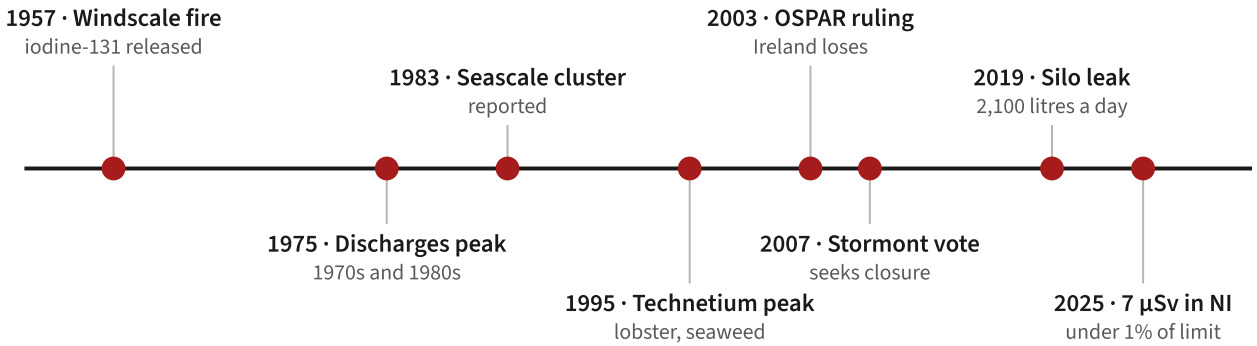
UK CBAM starts on 1 January 2027 under the Finance Act 2026, for iron and steel, aluminium, cement, fertiliser and hydrogen; registration at £50,000, first return by 31 May 2028 (HMRC). The UK intends to exempt EU-origin goods from 1 January 2027: HMRC's draft legislation (23 November 2026) is not yet law, so keep origin evidence. Whether a load into NI, including from the Republic, is caught is a customs question.

EU CBAM (Regulation (EU) 2023/956) has been in its definitive phase since 1 January 2026: EU declarants account for 2026 imports, buy certificates from February 2027 and surrender them by 30 September 2027 (EPA Ireland). The EU's exemption for UK goods is expected from 1 January 2028; it is not yet law. It does not apply to goods placed on the EU market from NI (InterTradeIreland); whether it could reach goods entering NI is unsettled as at 27 November 2026 (CITP). Take specialist advice.

Seventy years of discharges, now a small dose

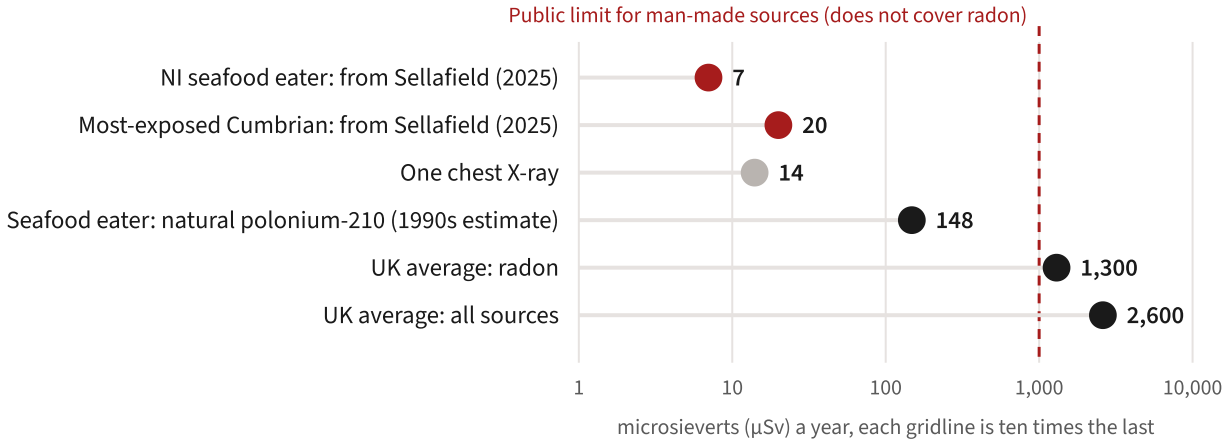
Sellafield has put radioactivity into the Irish Sea since the 1950s. Most of what remains is bound into mud off Cumbria. What reaches people in Northern Ireland today is measurable and small.

Seventy years of Sellafield: doses have fallen about tenfold since the 1980s



Sources: NAO (2024); RIFE 31; COMARE; Permanent Court of Arbitration; NI Assembly Official Report, 25 October 2007.

Sellafield adds 7 µSv a year in NI; radon gives the average person 1,300



Sources: RIFE 31 (2025 data); UKHSA dose comparisons; polonium figure from Ireland's radiological institute as reported in 1996. In Cumbria the most exposed group's total is 510 µSv, of which 490 comes from an old phosphate plant at Whitehaven, not Sellafield.

What the small number leaves out

- **Small is not zero.** Regulators assume any dose carries a proportionate risk.
- **Seascale.** A real excess of childhood leukaemia near the site in 1963–1990 was confirmed by the official expert committee, which judged the doses far too small to explain it and found no excess after 1991.
- **Accident.** Ireland's EPA rates a severe accident as unlikely, but food controls could follow.

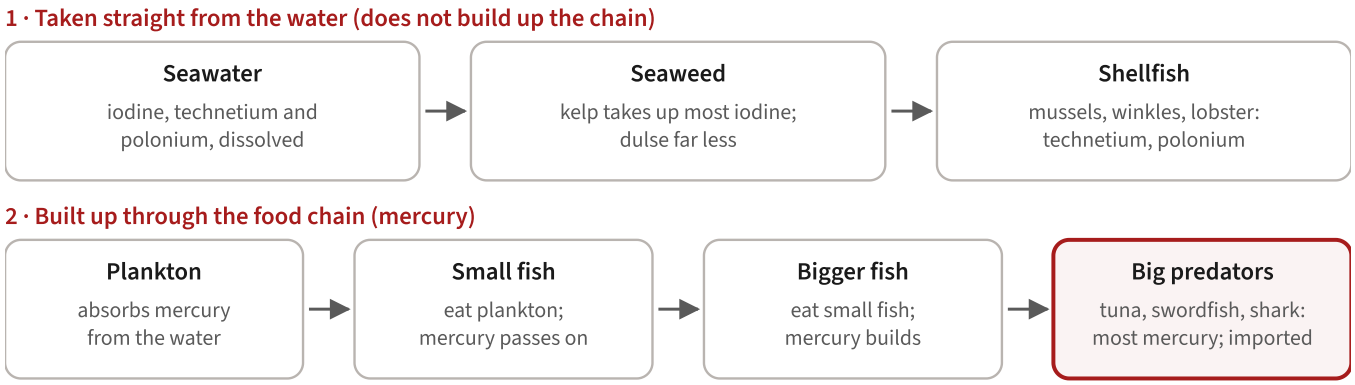
The bill and the trend

- Clean-up is forecast at £136 billion, running to 2125. A waste silo has leaked about 2,100 litres a day since 2019.
- Discharges of technetium-99, the isotope that shows up in lobster and seaweed, are down by a factor of about 66 on the late 1990s (OSPAR, 2023).
- Plutonium and americium remain in seabed near the site. Wildlife doses were below the international reference level in a 2023 UKHSA assessment, as summarised by Sellafield Ltd.

The limits that matter are mercury and iodine

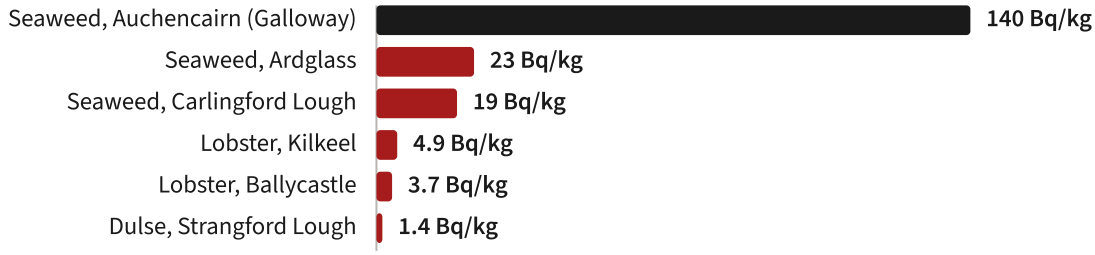
The health question about seafood is chemical, not radioactive. Different substances build up in different places, and knowing which is which is most of the answer.

Two routes into food: straight from the water, or up the food chain



The big predators that carry most mercury are imported, not Irish Sea catches (FSAI).

Technetium-99 from Sellafield in seaweed and lobster, 2025: the plume hugs the Scottish side



Becquerels per kilogram; red = Northern Ireland. All far below levels of concern: NI seafood eaters' total dose from Sellafield is 7 µSv a year. Source: RIFE 31; dulse is listed there under its older name, Rhodymenia.

Fish

- Eat at least two portions a week, one of them oily (NHS).
- Under-16s and anyone pregnant or trying to conceive should avoid shark, swordfish and marlin.
- Oily fish: at most two portions a week for girls and women who may have children; four for others.

Dulse

Dulse is gathered at Ballycastle and Carnlough. The UK programme samples it at Strangford Lough and finds 1.4 becquerels per kilogram of technetium-99 and 0.87 of caesium-137 (RIFE 31, Table 8.2(a), 2025), a trace. Hand-gathering needs the landowner's permission but no licence.

How little seaweed reaches the adult daily iodine limit



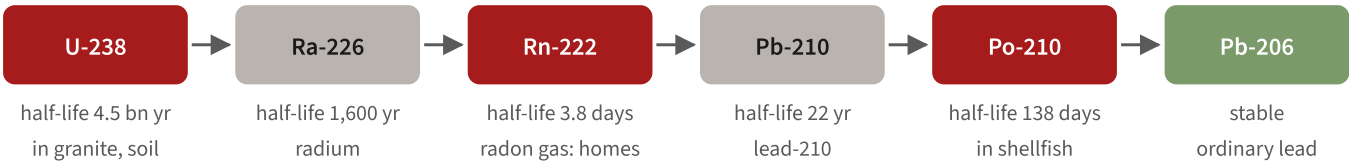
600 micrograms a day (EFSA). Dulse at 200 mg/kg, kelp at 3,000 mg/kg. Source: FSAI, 2020.

Dulse has far less iodine than kelp, but a 25–50 g snack bag can still exceed the limit several times over. Occasional eating is fine; pregnant women and people with thyroid conditions should take care with seaweed and avoid kelp supplements.

Northern Ireland's largest radiation dose is natural

Uranium in granite and soil decays, step by step, into radon, a gas that seeps into buildings. It is estimated to cause about 30 lung cancer deaths a year in NI and about 350 cases a year in the Republic, mostly among people who smoke cigarettes or used to.

Radon and polonium come from the rock, not from Sellafield



Simplified from 14 steps. Polonium-210 is concentrated by shellfish: a 1990s Irish estimate put it at about 148 µSv a year for seafood eaters, far above Sellafield's share.

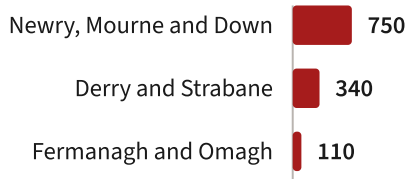
Radon gives half of the average UK resident's 2,600 µSv a year



Radon from the ground — Other natural sources, medical and the rest

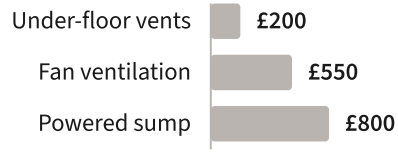
Radon is half of the average dose. For scale, Sellafield's 7 µSv for NI seafood eaters would be under one three-hundredth of this bar. Source: UKHSA; RIFE 31.

Newry, Mourne and Down has the most measured high-radon homes



Homes at or above 200 Bq/m³ among those measured. Source: UKHSA, 2016.

Most homes can be fixed for £200–£800



Contractor-installed, 2007–2017 prices, so higher now; a sump can reach £2,000. Source: UK radon service.

The policy point

As a dose comparison, fixing high-radon homes would cut more dose in NI than any change to Sellafield's routine discharges; neither source is thereby harmless. Employers already must measure.

Three things a householder can do

1 · Check. Look up your address on the UK radon map. About one NI home in five is in an affected area.

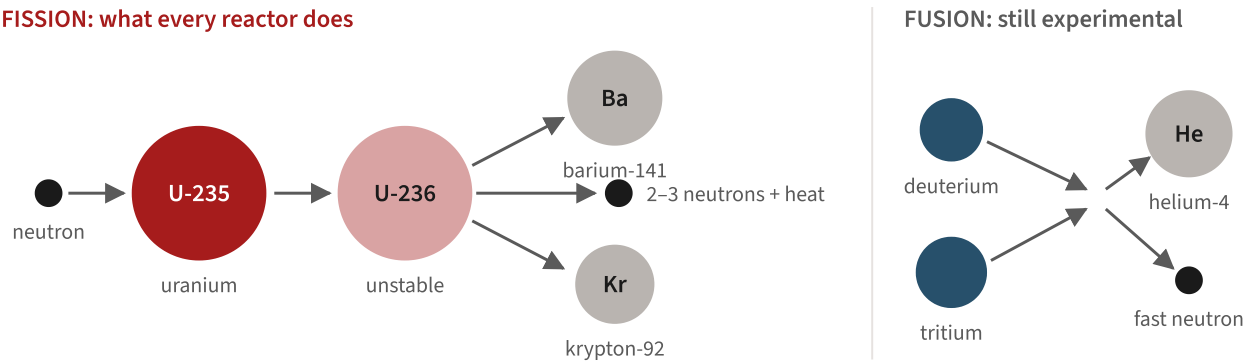
2 · Test. A home test kit costs £52.80: two detectors, left for three months, then posted back (GOV.UK).

3 · Fix, and stop smoking cigarettes. If the result is at or above 200 Bq/m³, fit ventilation or a sump. Smoking cigarettes multiplies the radon risk.

Splitting atoms to boil water

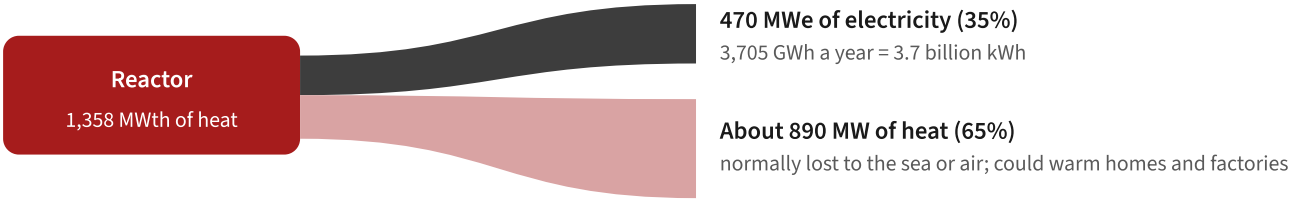
A reactor is a kettle. Splitting uranium atoms releases heat, the heat makes steam, and the steam turns a generator. Only about a third of the heat becomes electricity.

Fission powers every reactor; fusion is still an experiment



Fission powers every reactor, large or small. Fusion joins light atoms; the UK's prototype aims to operate in 2040. Cold fusion is covered in the box below.

Only about a third of a reactor's heat becomes electricity; the rest could heat towns



MWth = megawatts of heat; MWe = megawatts of electricity. 470 MWe × 8,760 hours × 90% = 3,705 GWh a year. Source: Rolls-Royce SMR.

Cold fusion: why the claims confuse

Since 1989, claims of fusion at room temperature have never produced net energy. A 2025 experiment showed chemistry can nudge fusion rates by about 15%: real science, not a power source.

The test for any energy claim is simple: more useful energy out than goes in, after every conversion. Heat to electricity loses about two-thirds in a steam plant, so a device that only just breaks even on heat still loses on electricity. A faster reaction rate is not the same as net power.

The 25 MWe unit is a real design, not yet a product

Rolls-Royce calls it an advanced modular reactor (AMR): rated up to 25 MWe of electricity, from 75 MWth of heat a unit, aimed at markets below 50 MWe such as industrial heat, ports, data centres and remote communities. Its page gives no licensing stage, dates or prices (checked 27 November 2026). It is the size that fits a town such as Larne with its industry.

MW, MWe, MWth and MWh: power, and energy over time

A watt measures how fast energy flows. A watt-hour measures how much has flowed. Most confusion about reactors comes from mixing the two.

Unit	What it measures	Examples
kW, kilowatt	Power: 1,000 watts, the rate energy is used or made	A kettle draws about 3 kW while it boils
MW, megawatt	Power: 1,000 kW	NI's peak demand is about 1,520 MW; on a summer night about 450–500 MW
MWth	Heat a reactor or boiler produces	Rolls-Royce SMR: 1,358 MWth; its advanced modular reactor (AMR): up to 75 MWth
MWe	Electricity sent out, after turning heat into power	Rolls-Royce SMR: 470 MWe; AMR: up to 25 MWe. About a third of the heat becomes electricity
kWh, kilowatt-hour	Energy: 1 kW for 1 hour	A 3 kW kettle running for 20 minutes uses 1 kWh
MWh	Energy: 1,000 kWh	An average NI home's electricity for about four months (3,179 kWh a year, 2024)
GWh	Energy: 1 million kWh	The electricity of about 315 NI homes for a year
TWh	Energy: 1 billion kWh	All metered electricity in NI in 2024: 7.2 TWh

Worked examples

- **Power to energy:** multiply by hours. 470 MWe × 8,760 hours in a year × 90% of the time running = 3,705,000 MWh = 3,705 GWh.
- **The small unit:** 25 MWe × 8,760 × 90% = 197 GWh a year: about 62,000 NI homes' electricity.
- **Energy to average power:** divide by hours. Mid and East Antrim, Larne's council, used 485 GWh of metered electricity in 2024: an average of 55 MW, which two to three of the 25 MWe units would meet.
- **Heat matters too:** the AMR's 75 MWth includes about 50 MW of heat that a heat network could use (section 10).

Why the "e" matters

A reactor rated 1,358 MWth is not three times bigger than one rated 470 MWe: they are the same machine, measured before and after the turbine. Always ask whether a figure is heat or electricity, and whether it is power (MW) or energy (MWh).

Load factor

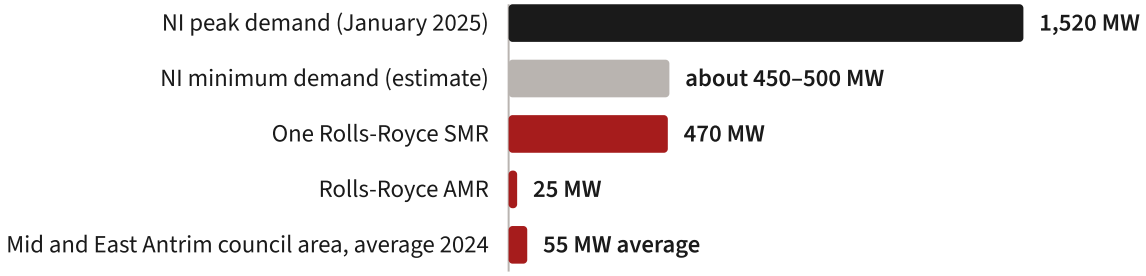
No plant runs flat out all year. Nuclear runs about 90% of the time; NI's wind turbines produced far less of their maximum, and NI turned down 22% of available wind in 2025 (section 10). Compare plants on energy made a year, not on their MW rating.

Home use: DESNZ subnational statistics for NI, 2024 (mean domestic consumption per meter). Reactor ratings: Rolls-Royce.

“Small” is still two-fifths of NI's electricity

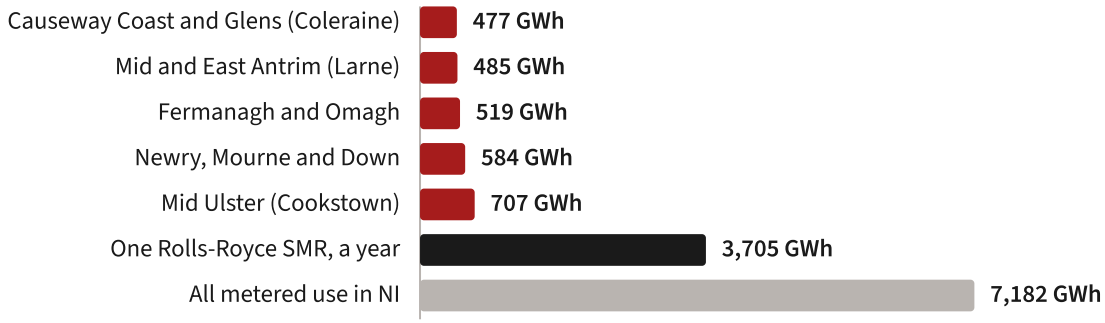
The Rolls-Royce small modular reactor comes in one size, 470 MWe. One would make 3,705 GWh a year, 42% of the 8,865 GWh NI used in the year to June 2026 (DfE). Three are planned at Wylfa; none in Northern Ireland. As at 27 November 2026 the design is in Step 3, the final step of the regulators' Generic Design Assessment, which the Office for Nuclear Regulation expected to finish in December 2026; no completion announced by 27 November 2026. It covers Great Britain, not NI.

One 470 MWe reactor is about the whole of NI's demand on a summer night



Sources: the System Operator for Northern Ireland (SONI); Rolls-Royce SMR; Rolls-Royce for the 25 MWe unit; council average from DESNZ metered data, 2024.

One 470 MWe reactor would make nearly eight times what Larne's council area uses



Metered electricity, homes and businesses, 2024. Source: DESNZ subnational electricity statistics for NI (December 2025). Town figures are not published, so councils are shown. DfE's 8,865 GWh is a wider measure including large users and losses.

Why the big one fits badly

- On a summer night it would about equal all NI demand, leaving no room for wind.
- NI turned down 22% of its available wind in 2025.

In its favour: NI is forecast to be short of firm capacity by 100–200 MW from 2026.

The town-sized version

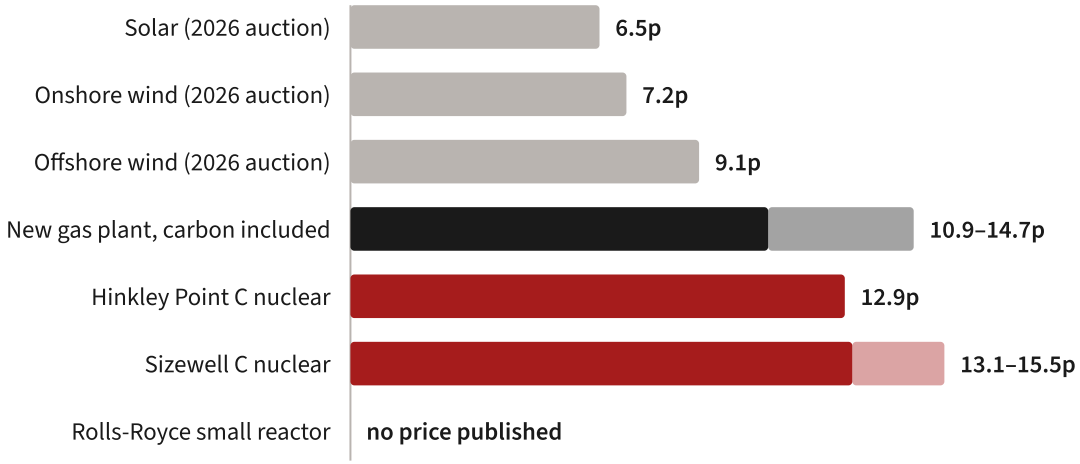
Rolls-Royce's advanced modular reactor is rated up to 25 MWe of electricity or 75 MWth of heat a unit: the scale of Larne, Coleraine or Cookstown with their industry. It has no published licensing stage or price (section 8).

Heat under the streets. As Iceland does with geothermal water, a reactor's waste heat can warm homes through sealed pipes. China's Haiyang station heats about 400,000 people (IAEA, 2025). NI would first need heat networks.

Wind and solar are cheapest to contract; nuclear is firm but dearer

No price has been published for a Rolls-Royce small reactor. The chart shows the latest official prices for everything else, in pence per kilowatt-hour.

New wind and solar are cheapest to contract; nuclear costs more and has no small-reactor price



2024–25 prices. Sources: DESNZ auction results; DESNZ generation costs 2025; NAO on Sizewell C (2026). Multiply by 10 for £/MWh.

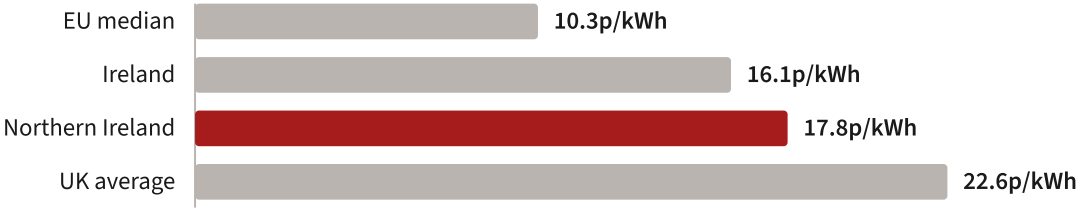
Why the rows are not like for like

- Wind and solar prices leave out backup, storage and grid. The last official estimate added roughly 2p–4p per kWh for offshore wind.
- Wind contracts last 20 years, Hinkley's 35, and Sizewell's figure covers 60.
- Hinkley is costing about double its first estimate; EDF's January 2024 estimate put first power four to six years after the 2025 date planned in 2016.

The only small-reactor numbers

- Ontario's four 300 MW units are budgeted at C$20.9bn. Its owner expects about 8p per kWh, close to its estimate for wind, solar and batteries.
- A US project was cancelled in 2023 when its subsidised price rose to $89/MWh.
- Decommissioning must now be funded in advance and adds a few per cent.

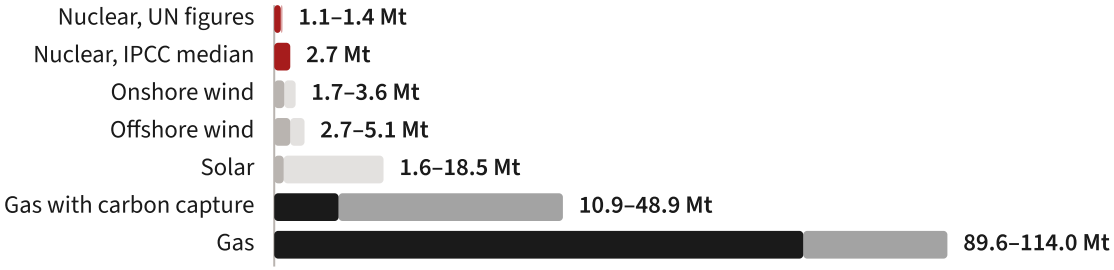
NI large users pay more than Ireland and the EU, less than the UK average (late 2025)



Excluding VAT. Source: Utility Regulator. Gas sets much of the NI price.

Low-carbon either way; independent only up to a point

Gas would emit over 30 times more than nuclear for one reactor's 60 years of electricity



Million tonnes of CO2-equivalent over the whole life cycle. Sources: UNECE (2021); NREL review. 222 billion kWh over 60 years. Estimates for nuclear vary; on all of them it sits with wind and far below gas.

Where NI's energy comes from



GWh of final energy use, 2023. Source: DfE, Energy in Northern Ireland 2026.

About three-quarters of the energy NI uses is imported oil and gas, mostly for heat and transport. Electricity is under a fifth, and half of that is now renewable.

What a reactor would and would not change

- NI has no gas storage, and gas made 49% of its electricity in 2025.
- A reactor would cut gas burned for power. Its 3,705 GWh would be about 9% of the 41,030 GWh of energy NI uses.
- It would swap dependence on gas markets for dependence on Great Britain for fuel, regulators and waste. Uranium comes from Kazakhstan, Canada and Namibia; there is none mined in Ireland.
- The bigger prize is electrifying heat and transport and insulating homes, whatever makes the power.

Insulation: why it pays three times

The taxpayer. Fixing the worst hazards in NI's poorest homes, chiefly cold, would save the health service about £39.5m a year and pay for itself; poor housing costs society £401m a year (NIHE and BRE, 2016).

The environment. 61% of NI homes heat mainly with oil (NISRA, 2024/25). Heat not lost is oil not imported or burned, and a smaller heat pump when the boiler goes.

The household. In 2016, 22% of NI households (160,000) were in fuel poverty (NIHE); 2023 results were published on 30 September 2026 but not read for this paper. 73% of homes have loft insulation but only 58% wall insulation (NISRA). Warmer homes mean lower bills and less damp. Ventilate as you seal: tighter houses trap radon (Radon).

Four governments, one sea, and no seat for Northern Ireland

Where	Position, checked 25–27 November 2026
Stormont	The Assembly voted on 25 October 2007 to seek Sellafield's closure; a pro-nuclear amendment fell 36–39. In this mandate the Assembly's questions database shows no question mentioning Sellafield and three on nuclear matters. In September 2024 the environment minister answered that there are no nuclear facilities and no nuclear waste stored in Northern Ireland (AQW 15272/22-27). In April 2026 the Economy Minister answered that "nuclear policy is an excepted matter" and that her officials engage regularly with the UK energy department (AQW 44359 and 44360/22-27). Nuclear energy is an excepted matter kept at Westminster, but planning and generating consent for a station would be decided in NI.
Westminster	Chose Wylfa for three Rolls-Royce reactors; contract signed 13 April 2026 with £2.6bn of public money. Told a Strangford MP on 10 February 2026 that an NI reactor "is devolved" (Hansard), while Stormont's Economy Minister says nuclear policy is excepted: each government points to the other. The planned underground waste store has no site. The Treasury's projects authority rated it red, "unachievable" as planned, on affordability grounds, with a whole-life cost of £20.3bn to £53.3bn in 2017–18 money (NISTA annual report data, August 2025); Lincolnshire withdrew from siting in June 2025, leaving two Cumbrian areas.
Dublin	Nuclear power is barred by laws of 1999 and 2006. A private member's bill to lift the bars has been announced and reported as lodged with the Bills Office, but as at 25 November 2026 it is not among the 116 bills of 2026 on the Oireachtas register, so it has not had a First Stage; the Taoiseach has said the Government will examine it. Ireland's 2026 emergency plan says iodine tablets would not be needed after a UK accident, and does not mention Northern Ireland.
Isle of Man	30 nautical miles from Sellafield, with its own monitoring. Its Chief Minister told Tynwald in April 2025 that waste siting is a matter for the UK.
Together	The UK–Ireland Contact Group on Radiological Matters met on 7 May 2026 and discussed reactor siting. No NI or Manx body sits on it. The British-Irish Parliamentary Assembly, which includes MLAs, has an inquiry open.

A reactor in NI needs at least five consents; three would be NI decisions, on our reading



At least five consents. Red outline = decided at UK level. Design acceptance is by ONR and the environment agencies, a DAERA marine licence would cover cooling water, and nuclear installations are excepted under Schedule 2 to the Northern Ireland Act 1998: whether NI planning and generating consents reach a nuclear station is untested. This is our reading, not settled law.

Rights neighbours already have

The Espoo convention obliges states to notify neighbouring states, so for Wylfa that means Ireland, not NI, which is in the same state. The Aarhus principle lets the public take part wherever they live, so NI residents and councils can respond to Wylfa's consultations. Wylfa is about 120 km from the Down coast.

Ireland in court

Ireland lost its 2003 case for Sellafield documents, and was found in 2006 to have broken EU law by suing the UK outside the EU courts. Since Brexit that bar has gone, but with doses under 1% of the limit a case would be hard to win.

A small reactor for Northern Ireland: both sides at their strongest

For

- **Safety record.** Deaths per unit of electricity are about 0.03 per TWh for nuclear, including Chernobyl and Fukushima: the same class as wind, against 2.8 for gas and 24.6 for coal; solar is lower still at 0.02 (Our World in Data, secondary source).
- **Firm, low-carbon power** on little land, whatever the weather, when NI faces a capacity gap.
- **Heat as well as power** for towns and factories.
- **Price stability.** Fuel is a small part of the cost and can be stockpiled for years.
- **Renewables have costs too:** seabirds, fishing grounds, pylons and backup.

Against

- **No price.** First-of-a-kind reactors have a record of overrunning; studies find small-reactor estimates optimistic.
- **Waste.** No UK disposal site exists. Spent fuel would sit in NI for decades. One study found some small designs make more waste per unit of energy than large ones (not the Rolls-Royce design).
- **Fit.** At 470 MWe it crowds out NI's own wind.
- **Cooling water** would kill fish: millions a year are expected at Hinkley Point C once it runs, a station seven times the size.
- **Dependence** moves to GB and to foreign uranium mines; mining leaves its own pollution abroad.
- **Time.** Nothing could run before the late 2030s; renewables can be built this decade.

Nuclear, wind and solar are the safest sources per unit of electricity



Source: Our World in Data (2020; a secondary source), drawing on Markandya and Wilkinson (The Lancet, 2007) and Sovacool et al. (2016). Nuclear includes Chernobyl and Fukushima.

Four options; our view combines B, C and D

A — Rule it out
Costs nothing now. Closes off firm low-carbon power later.

B — Wait, with triggers
A Wylfa price · a waste-disposal host · a SONI grid study.

C — Prepare now
Grid study, siting screen, skills audit and supply chain, starting this year.

D — All-island route
Work with the Republic, which would first have to lift its legal bars.

Our view (in red): **prepare now** (C), **commit when the triggers are met** (B) and **build the all-island route** (D).

Twelve things to do, and who should do them

	Recommendation	Who	Cost
1	Publish one NI seafood and seaweed summary a year: radioactivity (including dulse), mercury and iodine advice, shellfish grades and stock status.	DAERA, FSA in NI, NIEA	Reuses data already collected
2	Enforce employers' radon duties, add a radon test to home sales in affected areas, and pair it with advice on giving up cigarettes.	Health and Safety Executive for NI (HSENI), Department of Health, Public Health Agency (PHA), Education, councils	£200–£2,000 a home to fix
3	Keep food advice simple: two portions of fish a week, one oily; care with kelp; dulse in moderation.	FSA in NI, Public Health Agency	Existing campaigns
4	Ask the Assembly to revisit its 2007 position and take evidence on reactors and cross-border emergency plans before May 2027; seek an NI seat at the UK–Ireland Contact Group.	MLAs, four committees, the Executive	Committee time
5	Plan for small and advanced modular reactors, north and south: commission the grid study, siting screen and skills audit now, and commit when the triggers in section 14 are met.	Executive, DfE, SONI, Irish Government	A study budget
6	Build what is priced and available for energy security: interconnection, storage, wind, solar, biomethane, heat networks and insulation, and trial new technologies such as transparent solar PV, with honest accounting of grid costs and wildlife.	DfE, SONI, NIE Networks, DAERA	Set by NI auctions from 2027
7	Keep cross-border contact on Sellafield and Irish nuclear policy; respond to the Wylfa consultations and ask Dublin to use its Espoo notification rights.	Executive, North South Ministerial Council (NSMC), councils	Officials' time
8	**Before UK CBAM starts on 1 January 2027:** manufacturers importing iron and steel, aluminium, cement, fertiliser or hydrogen should list 2027 imports by origin, test them against £50,000 and keep origin evidence on file.	Firms, trade bodies	One to two days
9	Publish a register of NI firms qualified for nuclear work and hold a supplier day. Up to £1.4bn of reactor contracts are opening; no NI supplier is yet named.	Invest NI, DfE	Officials' time
10	Publish a large-user price comparison and a gas-price sensitivity for NI industry.	DfE, Utility Regulator	Officials' time
11	Land and eat more NI seafood: a welcoming "Friday fish" and Lent campaign, led by herring and with mackerel, mussels and crab, in schools, hospitals, shops and church halls, open to all; more processing at home so prawns, crab and pelagic fish are sold as finished products.	DAERA, Invest NI, Public Health Agency, councils, the Churches	Uses existing marketing funds
12	Run a whole-house insulation and ventilation programme for oil-heated and fuel-poor homes, with radon testing built in, under the Warm Healthy Homes Strategy (DfC).	Department for Communities, NIHE, councils	Repaid by NHS and fuel savings

How this was made, and what is still an estimate

Researched to 27 November 2026 from official and primary sources where they exist. The research direction, questions and judgements are Robert J. Park's. Facts were checked at source between 25 and 27 November 2026. It has not been peer-reviewed by outside experts.

Data gaps closed on 27 November 2026

- **Landings by port:** from the MMO's 2025 tables.
- **Assembly debates:** the Official Report search finds no mention of Sellafield from 2022–23 to 2026–27; "nuclear" in 2025–26 finds 25 contributions, mostly on weapons and Iran.
- **Electricity by area:** DESNZ metered use by council, 2024 (towns are not published).
- **Carried from earlier editions, not re-checked at source for this one:** £1.4bn of reactor contracts; NI homes paying 30.6p/kWh; the 100–200 MW firm-capacity gap; 22% of wind turned down in 2025; minimum demand; 30 radon deaths a year; one home in five in a radon-affected area; 2,059 fishing jobs; Ontario's 8p/kWh; gas at 49% of electricity in 2025.
- **Still a summary:** the wildlife dose is quoted from Sellafield Ltd's summary of a 2023 UKHSA assessment; aquaculture tonnages come from the industry's own group.

Related work by Robert J. Park

- Caught here, landed elsewhere: where NI seafood goes
- The SPS deal: what NI gains, what it gives away
- Radon: the gas from the ground a tighter house can trap
- The Irish Sea carbon bill: who pays to cross
- Crown Dependencies, ferries and carbon
- The 2027 CBAM horizon
- The carbon deal: who pays, who gains
- Larne already has taken carbon out of the atmosphere
- Crystals in Confinement: from sea urchins to soil
- Element briefings: uranium, caesium, iodine, mercury, radon, strontium

Main sources

- Radioactivity in Food and the Environment 31 (2025 data)
- UKHSA dose comparisons
- NAO: Decommissioning Sellafield (2024)
- COMARE 17th report (2016)
- EPA Ireland: Sellafield assessments
- OSPAR Quality Status Report 2023
- ICES advice, Dublin Bay prawns
- Seafish/Cefas for DAERA (2026)
- FSAI seaweed report (2020)
- NHS fish advice
- DAERA seaweed harvesting statement
- UKHSA NI radon data (2016)
- Rolls-Royce SMR design site
- DfE electricity statistics
- DfE Energy in Northern Ireland 2026
- Gas Transmission Outlook
- Utility Regulator price report
- DESNZ auction results (2026)
- DESNZ generation costs 2025
- NAO: Sizewell C (2026)
- NREL life-cycle review
- Finance Act 2026; HMRC CBAM summary
- HMRC draft exemption legislation
- Northern Ireland Act 1998, Sch. 2
- Ireland: national emergency plan
- Dáil record, 6 May 2026
- Tynwald Hansard, 22 April 2025
- ONR: Rolls-Royce SMR assessment
- Sellafield Ltd environmental review 2024/25
- EU CBAM (business.gov.uk); InterTradeIreland
- MMO sea fisheries statistics 2025; DAERA landings
- DESNZ NI electricity by council
- MMO landings and trade tables 2025
- Code of Canon Law, cann. 1250–1253
- NIHE/BRE cost of poor housing, 2016; NISRA heat and insulation 2024/25
- Directive 2006/117/Euratom; Radioactive substances framework

AI was used to lay out this document and to generate leads from the consultant's research, knowledge and questioning; figures were checked against the official sources listed. Not legal, tax, customs or medical advice: where a decision turns on any of these, take specialist advice. Charts are original drawings from the figures cited. Photographs from Unsplash, credited where used. © Robert J. Park, 2026.

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