



8 KEY COMPONENTS

IN A FUTURE INFRASTRUCTURE
FOR THE ORKNEY ISLANDS, SCOTLAND

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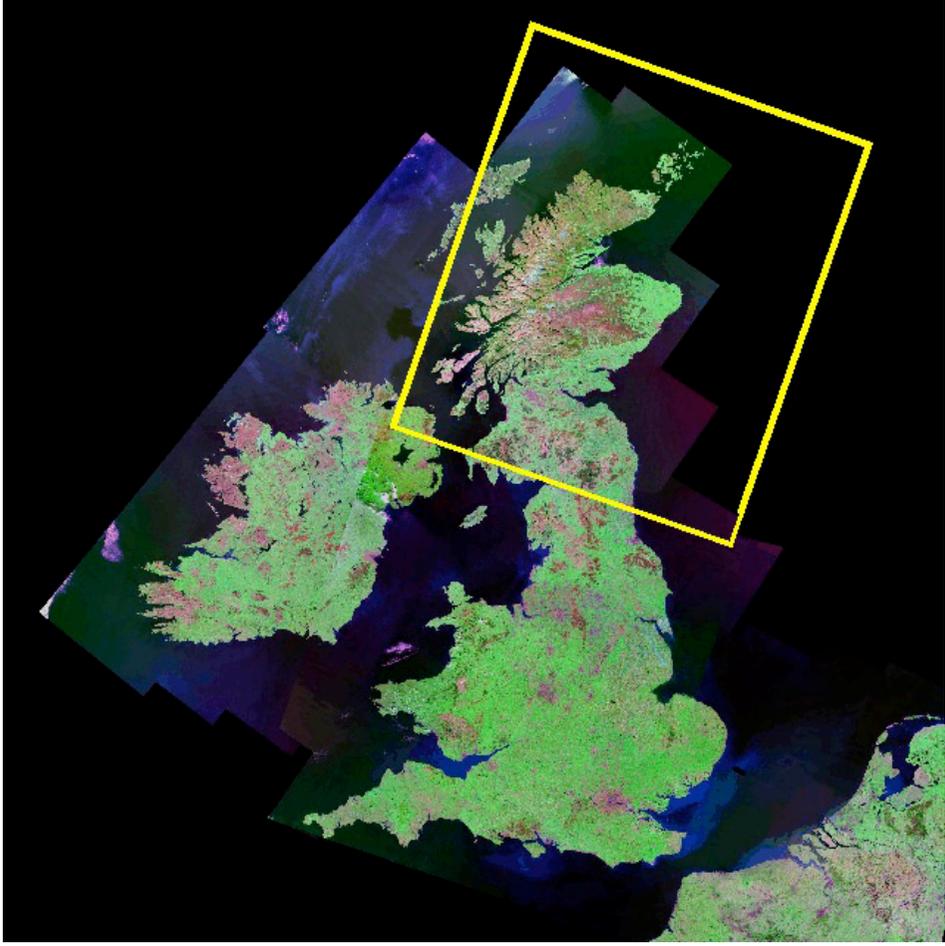
What kinds of connectivity infrastructure would reflect the kinds of futures that people in the Orkney Islands, Scotland, might aspire to?

This booklet is a response to that question. It draws on my ethnographic research (2007-2009) at Centre for Science Studies, Lancaster University UK, to consider how the future is imagined and made in everyday practice in the Orkney Islands, an archipelago off the north-east coast of Scotland.

It is intended to open up ideas about what infrastructure is, and how it might be imagined and designed differently.

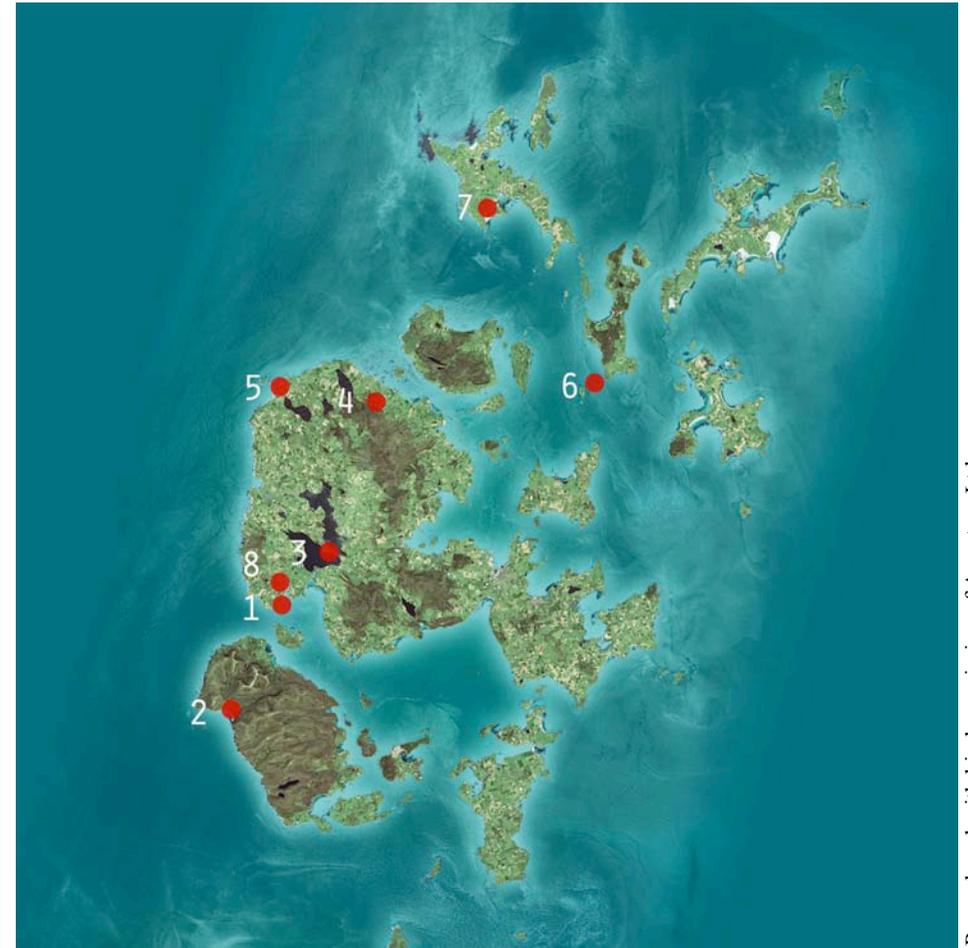
This is not a vision of the future, but instead a tool for inspiring many possible futures, whose characteristics and components are relevant for many possible places.

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● 8 KEY COMPONENTS

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SMES, STROMNESS



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COMPONENT: SEA

LOCATION: STROMNESS HARBOUR

Data, power, television, cars, and carrots, all must make the journey by this boat or cable through the feisty waters between Scotland and the islands. There is no earth for coax to snuggle forgotten beneath, or tarmac for trucks to drive over twenty-four seven. Most islands in the archipelago are two ferry journeys plus a twenty hour drive from London; international courier companies look to their small-print and class deliveries as 'oversea' and next-day is impossible.

Yet this is not a backwater. The sea is a routeway that connects the archipelago to particular places and not others through favourable currents. Other island and coastal nations come to do business here: Taiwan, Portugal, Chile, Norway. Pipelines tether North Sea oil platforms, and their wealth, to the oil terminal. There is high-tech and green-tech industry, and two university campuses.

From London we seem at the edge of the world, but by sea we are connected-in to the world. However, broadband provision is imagined and made in land-lubber London. So it takes an assortment of precarious microwave beacons and undersea cables between the isles to keep the so-called 'landline' phones working; the lengths of copper from the exchange must be impressive, dulling the broadband to 0.5 Mbit/s. The sea is too much of an effort for the provider in some places, leaving ragged broadband 'not-spots' where the sums do not add up.

Orkney is the doorway between Atlantic Ocean and North Sea. The power that passes through here is measured in Gigawatts of potential marine renewable energy. When the hurricane-force winds blow, when the waves rise up and over the fields, this ferry may not run, and the electricity can go out. Then there are no more carrots, no more cars. Then there is no television, no broadband internet.



The sea makes the work of moving everything visible, the effort needed to move bits of bicycle and bits of data. The sea makes infrastructures visible.

I call a friend on another island, and can barely make out his voice through the crackle. The weekend storm took out the electricity, the mobile antenna, and the microwave beacon, so all the phones have been down. Six hundred people cut-off for days; if it happened near London it would be news, reporters livid. He is the engineer-entrepreneur on-call to fix the island substation. Like most on a small island it is one of his many jobs, for there is nobody else to call. He regales me with tales of dodging mad arcs of electricity in torrential rain.

The static on the line is not about distance but about sea state. It is the sea that determines what can and cannot move, and how fast. Marine charts, high-tide mark, and weather must be attended to when designing infrastructure here. I was told, with a wry smile, that the first microwave link built to deliver broadband went down at high-tide, because the provider did not account for the changing height of the sea over the arc of the Earth. Land-lubber computer models, perhaps.

“When the boat doesn’t go you’re stuck here,” says a local librarian. “So you’re connected to the weather, to supply chains... We have western consumerism, but it’s tempered here.” But this is not life at the periphery of consumerism, but the making of a different consumerism. Tempering is a practice that changes the constituents, makes things stronger yet more flexible.



Consumerism here is salted, briney, and in part self-sufficient.

When the boat does not run then you must be self-sufficient, you must grow your carrots, repair your cars, adapt your consumption. When the electricity goes out you must repair your substation, generate your own power. “It is the sea which has contributed to self-sufficiency,” says the island council brochure. Self-sufficiency is everyday living here, a matter of basic economic development as much as environmental concern.

Orkney needs a connectivity infrastructure that can be (more or less) self-sufficient, not in the engineering or accounting fairytale of no-maintenance, but in the bitter storm-force necessity of island-maintenance. The islanders are always already part of every infrastructure. They are the only ones who are here, who keep it going, keep the lights on, and the bit/s flowing. People and the sea need to be built-in.

Orkney seas make the fragility of networks visible. Here it is hard to imagine a ‘frictionless grid’, impossible to imagine ‘anywhere anytime anyone’ connectivity. Pervasive and ubiquitous information access makes little sense in a landscape where you can be cut off by the weather, both in body and digital bits.

It makes more sense to design for discontinuous infrastructure, where friction is valued and designed in; an infrastructure designed for seascapes.¹



COMPONENT: STONE

LOCATION: RACKWICK BEACH, HOY

These stones facing mainland Scotland cover a cable that connects Orkney to the UK electricity network. These stones mark the boundary of the network. The capacity of the cable fixes how much power Orkney can contain. The issue is not drawing power, but generating too much power from renewable resources in the islands. So Orkney has its own self-regulating Registered Power Zone, a semi-autonomous microgrid.

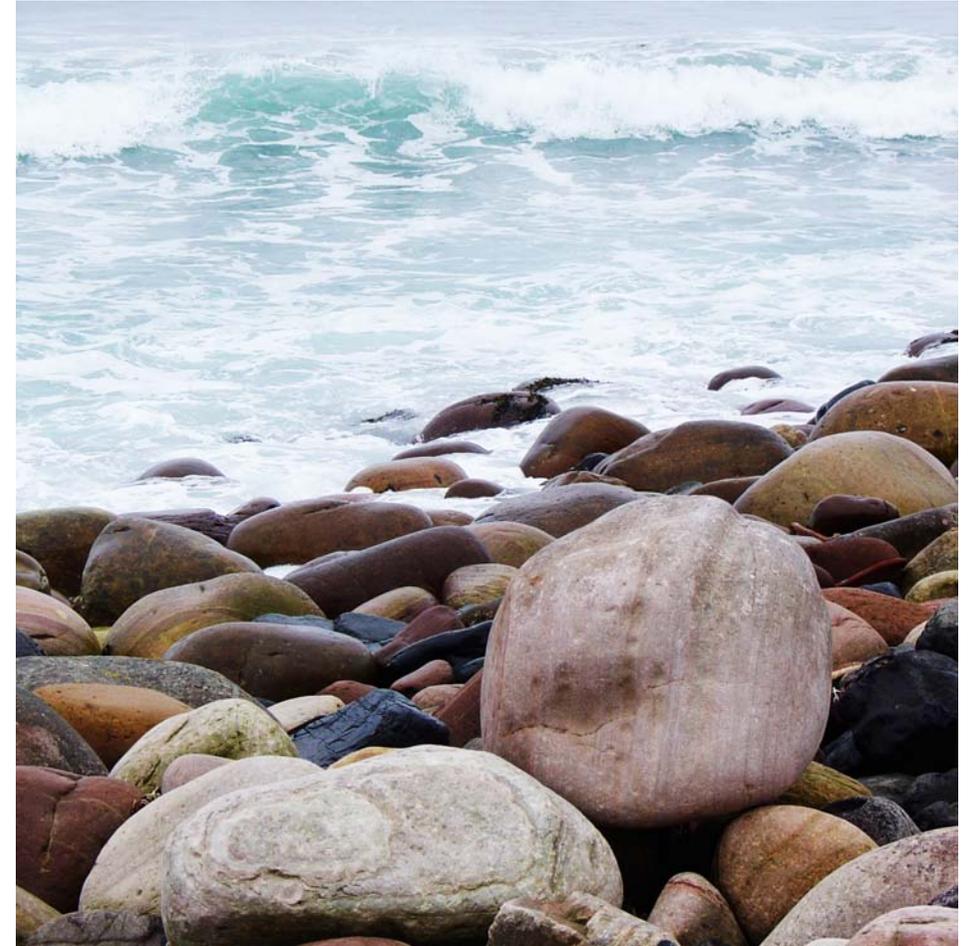
“In Orkney if you generate electricity it will be used locally, you can say that for sure [because of the Registered Power Zone]. Unlike in other places,” explains a local environmental consultant.

Orkney might be at the edge of Europe, but it is at the cutting edge of infrastructure management. Its distinct boundary makes its infrastructures local and distinct.

Electricity is being generated by the fourteen (and counting) Community Development Trusts, most of whom have raised the capital for an island wind turbine to generate and sell electricity in this Registered Power Zone.

The electricity is locally made, locally owned, and locally used.

Local ownership has deep roots here. This once Norwegian Viking archipelago still has its old Viking Udal Law system, where farmers have an absolute right to their land. It is in every way their land and shore and stone, and not given to them by the Crown or State. Some Orkney families cite their heritage and ownership of the land going back a thousand years.



The ownership of these stones on the shore and the electrons in the cable matter. They are Orkney stones and Orkney electrons. They are understood as being part of the place, part of the people who live here. Their electrons. Their electricity.

Local ownership of infrastructure is a matter of self-determination. “We are the last place the government will send energy in energy scarce times,” explains a local farmer. They prefer to own and produce what they consume, because then they can determine their future.

Orkney people, the Community Development Trusts, are not passive consumers of electricity and devices, but producer-consumers.

A company looking to build a large wind turbine farm was viewed with concern by some. In return for the environmental impact on their internationally important wildlife, on the wild beauty of the hills, what future would be made? The electrons and finance would not flow around the RPZ to the people of Orkney, but would leave under these stones and boundary markers, to feed investors and unknown others elsewhere. Instead of a self-determined future, such a wind turbine farm would leave their fate and finance to those who are unaffected when the lights go out in Orkney.

It is not only a matter of environmental concern, but a serious matter of the future viability of these fragile islands.

It is not hostility to outsiders, for Orkney is open to incomers, but a desire for shared ownership in the future.



Orkney perhaps needs a data infrastructure that is part of the islands, that partly belongs to these islands.

Along with the celebrated Orkney Island Gold beef farmed and exported around the world, perhaps there should be Orkney Island Gold data and electrons.

For this archipelago needs a data infrastructure that supports a self-determined future.



COMPONENT: MONUMENT

LOCATION: RING OF BRODGAR STONE CIRCLE

The Ring of Brodgar stone circle is an enduring technology. It is a still-working technology that has stood for 5000 years, and may yet stand for another 5000 years. The monument is part of the Heart of Neolithic Orkney World Heritage Site, but beyond its borders, are fields of standing stones, prehistoric villages, Iron Age settlements, Bronze Age barrows. The archipelago has one of the densest proliferations of prehistoric monuments in the world. Monuments, extraordinary and enduring technologies, are part of the landscape here.

The assessment of the Ring of Brodgar explains the inseparability. "...The entire skyline is defined by a series of visually interlocking ridgelines that create an unbroken interface between land and sky... These ridgelines are currently almost entirely devoid of modern features ...[and]... potentially directly reflect the visual experience that past generations would have had standing in these locations... This visual encirclement and the relationship between land and sky is clearly an important aspect of the modern experience of these monuments."²

The monument is inseparable from its landscape. The ring of surrounding hills forms a circular landscape that are as much a part of the circular monument as the stones. Archaeologists argue that the monument is a circular landscape made of earth, water, and stone.³

Due to its world heritage status, there is a planning buffer zone circumscribed by the distant ridgeline. All the landscape visible from the monument is within the Zone of its Visual Influence. Orkney is low lying, and the buffer zone covers a sizeable proportion of this island. In planning the future, the monument includes that landscape when it is taken in account. Extra care must be taken for the landscape that fills the buffer zone, not just the monument of stones.



A controversial proposal for three wind turbines on a hill, in that zone, led to a public enquiry. Archaeologists were asked to testify how the hills are part of the monument and therefore integral to the World Heritage Site monument. The UNESCO World Heritage Committee registered their concern, and requested the UK government to protect the visual integrity of the monument. As a local politician said to me, “you call it landscape. I call it politics.”⁴ Those wind turbines were not given planning permission, and the electricity infrastructure of the archipelago was changed.

That inseparability of hills, sky, and monument has an impact on infrastructure here. Monuments and heritage are future-making devices.

Monuments, old and new, natural and cultural, change the conditions of possibility for future infrastructures that can be built. And in Orkney there are so many monuments that future infrastructures are irrevocably changed here. You cannot roll out infrastructure in Orkney, as you might in places with fewer monuments.

Monuments resist infrastructure roll out. Infrastructure is changed by the natural and cultural landscape.

As an environmental planner explained, one electricity company thought to put in a new power cable between Orkney and mainland Scotland. They were used to having perhaps five archaeological sites en route to work around. But in this case, they



had five thousand registered archaeological sites along the cable route to consider. The infrastructure had to change.

Not only the monuments, but the landscape that the monuments includes, the hills and sky and water, also effect infrastructure. Data infrastructures are often designed to work best in flat urban areas, with low resistance to the rollout of cables and antenna. But Orkney protected hills and seas resist the propagation of cables, radio signals, and visible masts (and turbines). The Orkney landscape kicks-back at infrastructure futures, forces different futures to arise.⁵

The effect of landscape on infrastructure undoes the importance of a separation between mobile and fixed connectivity. Since (perhaps before) Fixed Wireless Access, and with recent moves to WIMAX, there has been a blur between such categories. What matters in infrastructure design is how the sociality, temporality and topography of the landscape promotes a particular infrastructure, and how it resists other technologies.

The inseparability of landscape and technology is made obvious. The boundary of infrastructure responds more to topography than politics.

Rather than rollout, which assumes infrastructure rolls *over* the world, an Orkney infrastructure would respond to geographic and social differences. It would be specific to geographies and communities, rather than just to regions and nations. There are political implications (e.g. regulatory regimes make national demands) as well as corporate and technical implications for this localised delivery of a data service.



COMPONENT: HISTORY

LOCATION: BURGAR HILL WIND TURBINE

This is the site of the UK's first large-scale experimental wind turbine. This was the location where the country had a research and development foray in to the wind industry. But the government did not invest in the burgeoning industry, and the country now has (more or less) no wind industry as a result. By contrast, Denmark took a different route and has a wind industry worth perhaps three billion Euros. But Orkney holds that history of a failed future in its buildings and bones. If you look down the hill from here you can see the now derelict visitors centre which once proudly proclaimed the site of a future industry.

Orkney is not an untouched, natural and wild place. Its striking beauty, which draws thousands of tourists every year, comes from its technological history under touchable silver skies. From its prehistoric stone tools to its farms fields, from its mills to its wave to its tidal turbines, Orkney has five thousand years of technological development, and technological memory.

History in Orkney goes all the way down. It is not a place where you can forget the lessons of the past. The scriptwriter explains that, out of his window, "is a Bronze Age village unexcavated in a field. Across the road is a farm with... Viking roots. Then on the shores to the right is an Iron Age broch [a stone tower], and behind was a [prehistoric] standing stone... So it informs the decisions you make. It's like being part of a long set of beads, that stretches thousands of years in to the past, and you're just a dot, part of it. And it influences how you think about the future."

Orkney is a landscape of enduring technology. The temporality of the islands is of the *longue durée*, deep time.

If the technology you look out on, as you design the future, has endured for five thousand years, then you can imagine designing



technology for the next five thousand years. This landscape is not in the past, but creates conditions of possibility for the future. You are forced to imagine the future here, because all around you are technologies that will stand long after you are gone.

Here it is possible to imagine an infrastructure that will last five millennia, an infrastructure of deep time.

But valuing history and future history is not about fixing old technology in place. It is about negotiating the rise of new technology from the old. The marine renewable energy industry in Orkney, all the people and organisations involved, can stand here and see this archaeology of the future, an archaeology of a failed renewable energy industry. They cannot forget. The islands hold the memory in concrete and brick. Many are determined that will not happen again.

A marine renewable company director took a government policy-maker here. He stood him on that plinth, on the concrete base of the old experimental turbine and said to the man, “this was what the wind industry was. This was the great hope and then we [the UK] blinked. Do you want to be responsible for another industry that doesn’t happen? Oh right, the man said, a bit taken aback. He got it.” Standing here you get that new technology requires old technology to make the distinction.

New futures require old histories. Otherwise how do you know it is something new?⁶ And new successful infrastructures require the memory of past failure.



COMPONENT: WIND

LOCATION: BIRSAY BAY

The sign on the door of the tearoom says, 'Please take care when opening this door in windy conditions (the people who make the regulations obviously don't live in a windy place)'. The regulations, made in places where wind is something freshening on the face, say that doors must open outwards for fire safety. But here in Orkney wind will turn the door into a battering ram. When I pick up my hire car I'm told in all seriousness to hold on to the car door when I open it in the wind, because it will either come off or be bent back.

Wind in Orkney is not the same stuff as Wind in calmer climates elsewhere.

There are consequences of this difference for infrastructure. Design and implementation decisions for infrastructure are made on the basis of standards and policy. But standards must have a fixed understanding on what something is. In standards and policy Wind (or Consumer or Energy) must be the same everywhere. However, that involves one version becoming the standard. Which version becomes the standard is the one understood by those who make the standards. And the regulations are made by those in London, Silicon Valley, those who don't live in a windy place. So it is not the Orkney version of Wind (or Consumer or Energy) that becomes fixed as the global standard.⁷ What is at stake is the right infrastructure for the job, for the future.

Standards are never global, they are always made in a particular places, by people with particular experiences. Global standards are always local.



So the same standard turns a door into fire safety technology in one place, and a lethal battering ram in another. Because standards are always local they create different resistances to different technologies in different places. The standard future is resisted, if not impossible, in some places, because places and their winds are different.

For example, there is a national UK policy for the cost of carrying electricity around the National Grid. The cost is associated with spare capacity and demand, nothing to do with where the resource is. So if you put up a wind turbine in London they will pay you, but the further north you go, and the windier it becomes, the more economically resistant the network is. In far northern Orkney, you have to pay three times as much as you might earn in London for the grid to carry your wind-generated electricity. The consultancies who do the sums and recommend policy live with an urban version of Wind. They have no embodied knowledge or experience of the sheer power of Orkney weather. Their recommendations reflect their particular, local version of what is important. Wind does not seem very powerful or viable resource where they live.

The network infrastructure resists energy generation where the wind is, and so resists the future of the wind industry.

A local politician, in an attempt to make an island version of Wind present to the policy-makers, invited the head of the electricity regulator to the islands. “I stood [him] at the top of [the hill] without a coat, and lectured to him about the hyper-efficiency of wind here... There is the capital and will here to make it [a wind industry]



happen. There is serious intent. [The regulator] landscape was big utilities, he didn't realise it was serious here."

Only by standing on top of a freezing hill, in a near storm, in a shirt and tie could the policy-maker learn the island meaning of the word Wind. His skin felt its raw meaning. His body understood it. No remote explanation had worked. He had to feel it pulling at the hairs on the back of his neck, freezing his bones. As the politician said to me later, "come visit us. Unless you've been here, you don't know." These local differences that get lost in a standard can sometimes only be understood by feeling them. Some things are embodied knowledge. You cannot be told, or read it from a PowerPoint chart. You have to go there to feel the difference in your bones.

An Orkney data infrastructure would be based on Orkney standards e.g. Orkney wind. Which would create a very different future technology.

Such an Orkney standardised infrastructure might then be deployed in Silicon Valley (rather than the other way round). One that was designed for high winds, for dispersed population, for island connectivity, for renewable energy sources.

An Orkney infrastructure would not be represented by a static Cloud shape. The network 'cloud' on charts floats over the world, as though connected everywhere the same. An Orkney infrastructure would perhaps be represented as windy, stormy, weather-bitten. Its cloud symbol would be like the weather forecast, different in different places, with rain, snow, sun, gales; acknowledging that the Cloud is always effected by wind and place.



COMPONENT: TIDE

LOCATION: TIDAL ENERGY TEST SITE, EDAY

The tides in Orkney, in the tight channels between North Sea and Atlantic Ocean, are some of the most powerful in the world. So here, in these waters, is the site of the world's first grid-connected tidal and wave energy generator test site (European Marine Energy Centre). Here at the periphery of Europe is the future of a new marine energy industry.

Here we are closer to the Arctic Circle than to London. But the UK Government is in London, and it has a London-centric view. The minister for energy said to those here, "it must be really hard, being so far from where it's happening." Even though it is in these tides (not London tides) that everything is happening. I'm told that visiting ministers have been surprised that there are high-tech companies on the islands, let alone a university campus or two.

Perhaps those visitors see the small-holdings and farms, and think that producing beef and cheese and whisky is living in the past. If so they do not realise that farming is a futures way of living, and demands a clear-eyed focus on the next ten years of soil, subsidy, and crop.

Tidal energy is just another farmed resource in five thousand years of Orkney farming: beef farms, wind farms, server farms. Five thousand years of future-orientated living (not living in the past, but living with the past).

Perhaps those visitors see political and electricity power as residing at the centre, in London or Brussels, and resist its devolution to the periphery.

Infrastructure has politics, as well as power. And its politics, at present, is of the centre.



OpenHydro tidal turbine at European Marine Energy Centre test site
OpenHydro Group Ltd.

For example, the UK telecoms regulator requires 3G operators to deliver service to 80% of the population. Not area, not location. The practical effect is that roll-out prefers urban dense population areas, central areas. There are no plans to deliver high-speed 3G mobile to the rural periphery, to places such as Orkney. It's not seen as economically viable nor meets government policy.

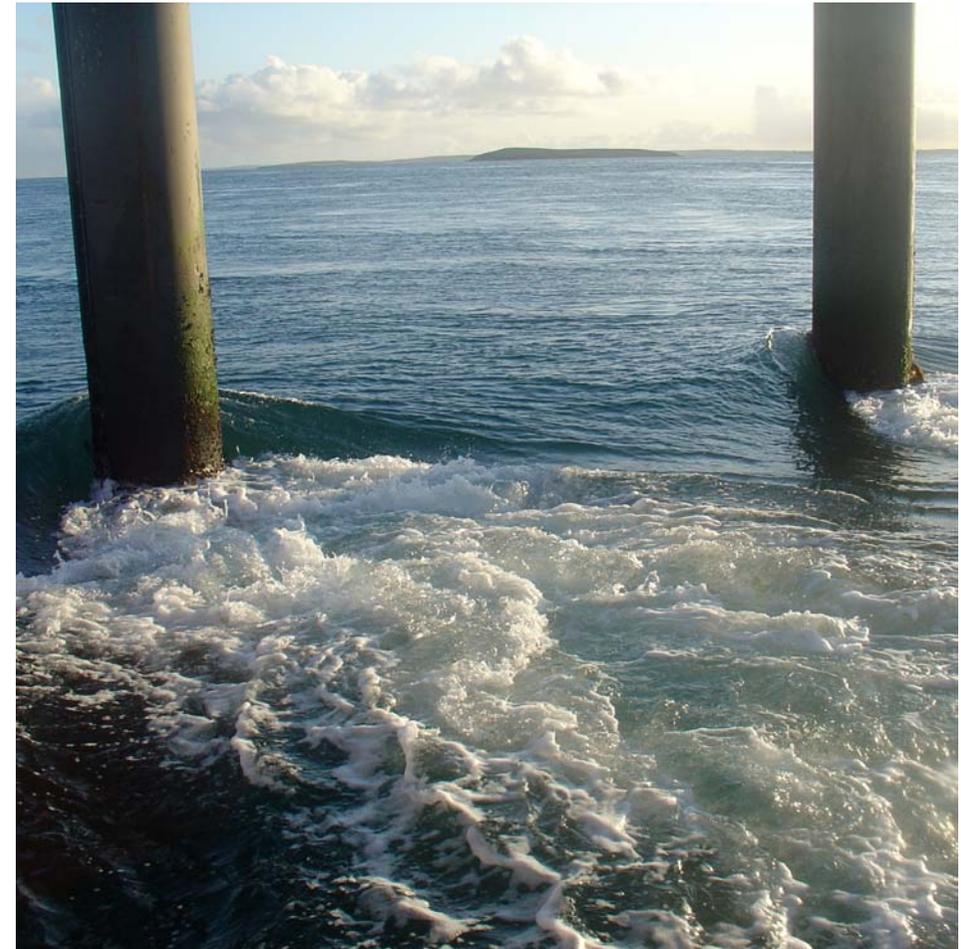
In the same move, with the same centripetal shape, the electricity infrastructure is designed for centralised power, for gas, coal, and nuclear.

But renewable energy is centrifugal. Renewable energy is distributed at the periphery of the UK, where the tides can be farmed. So data centres, for cloud computing and distributed computing, are relocating to the periphery, to where this green power is. City of London banks and multinational software companies, short on electricity to feed their economic number crunching, are looking to renewably-powered, landscape-cooled, data centres in the far north of Scotland.

Electricity and data infrastructures are becoming tightly coupled, their politics and landscapes binding together.

Electrical and computational power is moving away from the centre, to the edge, to where the green power is.

In complete tangent to current data infrastructure policy focused on the centre, on the urban.



The marine renewable energy director explains that those in the UK government say, “let’s make energy near the point of use. But it presupposes that you can move the point of production near the point of use. You can do it with oil, with gas.” You can pipe them, store them, move them and burn them where they are needed.

But you cannot move the tide.

Sustainable energy sources are not only at the periphery, not only distributed, they are also landscape-specific. So if the energy cannot move, then the data must.

Tidal-power and tidal-energy farms at the edge of Europe, means high-speed data infrastructures at the edge of Europe.

Leases for commercial tide energy generation in Orkney waters have already been won. Tidal-powered data infrastructures in Orkney may not be far behind.



COMPONENT: BRUCK

LOCATION: BIOGAS GENERATOR, WESTRAY

These are dis-used freezer containers on the island of Westray. They were used for transporting freshly caught fish. But they are there are no landfill sites to bury waste out of sight and out of mind. Here everything moves on and off the island by a boat that carries 25 cars at most on an open deck. Freezer containers are big and bulky to move. The weight and size of what is discarded resists being turned into simple rubbish.

So a container such as this now forms the pumping room for a demonstration of biogas generation. A startup company has built an anaerobic digester, and integrated it into a farm. It is a technology demo, a serious business proposition, made from a cattle byre, re-used refrigeration container and much else that is re-purposed. The parts may not be new, but this is technology innovation. Each anaerobic digester has to be different, made from different re-used parts, and designed for a different farm. As the company director explains, “it’s always in research and development.”

This re-newed and renewable electricity infrastructure is mutable. Its parts mutate from one place to another. It is an infrastructure that is able to adapt and be made from what is to hand, accepting local re-used parts.⁸ This is not the replication of what is designed in one place and rolled out everywhere the same. Instead of an infrastructure which is designed to be global, and globally the same, this is an always local technology, designed to be locally different.

This is an infrastructure engaged in the global issue of carbon-reduction and renewable power generation, made from locally available materials, using locally available natural resource. The global made local.



Bruck is the Orkney dialect term. It means more than just rubbish. It means things that can be re-purposed, re-used, stand-in, make-do, passed-on.

A local geologist explained to me, “as islanders we make do. If you needed a spare part you always knew someone who could make it - from tin, woodworking. We’re practical. That’s island living. You tied it together with string.” I’m told several stories of people breaking down in a storm or thick sea haar, and a farmer towing their car back to their farmyard, and somehow having both the right spare part for the car and enough expertise to fix it. The local radio breakfast show has a slot for *bruck* requests and exchanges, and Freecycle is hugely popular.

Rather than consume, you invent and are inventive. Rubbish becomes *bruck*. *Bruck* becomes an invention. These islands resist consumption and disposability, and promote invention and re-use.

E-Waste legislation now demands a different kind of design approach. Recycling requirements must be built-in to components made of so many minerals and metals. But in between mined mineral and recycled metal everything is shipped a few times around the world, as minerals, components, parts, products, sales, and scrap. The cost of rolling-out (and recycling) technology made somewhere else is high.

An Orkney infrastructure would be designed to mutate, to make inventive use of local *bruck* and spare parts in its design maintenance, and re-use. And the cost of its product lifecycle, from manufacture to recycled components, might be cheaper.



Anaerobic digester installed by Heat & Power Ltd.
Westray

COMPONENT: COLLABORATION

LOCATION: SMES, STROMNESS

In Orkney they have no fantasy of community, no imagined rural idyl of living happily ever after. As a local academic explained to me, “you have to sit on your tension [in community discussions] because tomorrow you might need that person... He is the only plumber on the island, so you cannot fall out with him.”

In Orkney they know that the term ‘community’ is often used for financial gain, for getting funding, and the benefits are not always equally spread. Community assumes mutual agreement, but not everyone agrees in a lived community. This does not lead to lack of decision but careful and collaborative decision-making. They know that community wind turbines and community infrastructure (bottom-up networks) require enormous amounts of negotiation, listening, often staying silent, in order to honour the term. As the ecologist says, “here collaboration is a natural identity. We are known for our collaboration, before collaboration was a buzzword. We have to collaborate to survive.”

I’m told that here, “it’s four or five years before you can have an opinion. You have to wait two winters to see if they [incomers] last.” In that time those who move here hold their tongue and listen and learn the way of doing quiet, Orkney island collaboration. This is not the same as corporate business collaboration. In corporate business everyone has an opinion from day one, and collaboration with colleagues is nine to five. Here you go to the pub with those you work and live next door to. As the ecologist explains, “in cities you gang up with people who are easy to talk to... In Orkney you are always talking to different people, with very different backgrounds.” In Orkney collaboration is twenty-four seven.

Collaboration is a craft you have to learn, which is particular to a place.



View from the offices of Aquatera Ltd.

As an academic explains to me, “we are all capitalists, but to an extent we look out for each other.” Or as a local shop keeper says, “you work together to keep each other in business.” You do not compete, you collaborate. “A business comes out of a collective symbiosis within the community,” explains a company director.

Orkney islands collaboration creates symbiotic connections between businesses and people; a different way of doing capitalism.

A company director says, “people come to Orkney and are intrigued, interested, blown away sometimes. But they don’t make the leap that the community can function as a corporate body.” The symbiosis between all the many small organisations and people makes something larger, something that works together, that can move together. As friend explains, “rather than my employer, I am part of Orkney PLC, Orkney Ltd. I spend a lot of my time promoting the well-being of Orkney, rather than the objectives of [my employer].”

“Place is a shorthand for People,” I’m told. “If you depopulated Orkney and filled it with [other] people it would not be the same place.” People and place are inseparable here. It is the people that act, and the place - the archipelago - that acts. Orkney PLC is the organisation that comes together, which Orkney infrastructure is embedded within and supports.

The many Community Development Trusts with their commercial subsidiaries for generating wind electricity are examples of such embedded infrastructure, built on island collaboration. The island economic manager explains, “it’s not about generating power, it’s generating people with knowledge of marketing, installation...



View from the offices of Xodus AURORA.

tacit knowledge.” Infrastructure here is not just about the technology it is about the people and their future, of which it is a part.

Here infrastructure has the community built-in. The place and the people and the technology act together, make their future together.

And when people and technologies act together, the future can happen very fast. It just takes a quick phone call around Orkney PLC to make big things happen. “We had a renewable energy forum of companies first, a community development trust in the 1980s, when urban places were not interested. We were the first place for an international renewables conference, and now there are hundreds of them... We see problems and feedback quickly, because of the awareness of being on an island and part of its community, so we can move quickly. “ My friend calls it being fleet-of-foot.

Global futures, bottom-up infrastructures, community green-tech, happen fast and first here.

Orkney PLC is a community of people and companies with technical and social expertise that forms an archipelago-wide test-bed for technology demonstrations (e.g. marine energy, wind energy). High-speed Orkney collaboration means new data infrastructures could be rapidly tried and tested here. A future Orkney infrastructure would be built in this social and technical test-bed, a prototype infrastructure built ‘at the edge’ to show how different future infrastructures could be made.

The future comes early to Orkney...



Repurposed wind turbine component forming part of the offices of Scotrenewables Ltd.

Endnotes

1. For a discussion of 'friction' see Lowenhaupt Tsing, Anna (2004) *Friction: An Ethnography of Global Connection*, Princeton University Press.

2. Heart of Neolithic Orkney World Heritage Site Setting Project, in *Heart of Neolithic Orkney Management Plan Appendix B*, Historic Scotland, 2008. p. 19.

3. Richards, C. (1996) Monuments as Landscape: Creating the Centre of the World in Late Neolithic Orkney. *World Archaeology*, 28(2), 190-208.

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