



# Renewing Renewables

# Core Argument

Decades-old assumptions about renewables and psychology mean that renewable energy is **significantly undersold** to consumers.

This is making climate change worse, and commercially weird.

People will buy improved quality of life and leisure given the opportunity. Renewable suppliers just do not give them the chance.

Products exist today that can be sold at scale if consumers change their assumptions.

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# Example: Elon Musk Gets it Wrong

Our grandparents knew electricity would transform their lives:

- Better health
- Easier work
- More leisure
- A new age of promise and excitement

They were correct.

But Elon? He sells cars and electricity with zero new personal benefits to consumers. They work the same, just burning the planet less.

That is not exciting. It will not improve our lives today. It is not motivational.

**Elon is a showman, and even he cannot make this model interesting.**

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## But first....

Caveat 1: This applies to societies fortunate enough to have had electricity for decades. These societies also have a problem of waste and overconsumption, and need to switch energy sources urgently.

Caveat 2: The commercial proposals in this document have only been possible since around 2015, when a convergence of technologies caused benefits to increase and prices to drop. That is why new thinking is possible.

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# A Cluster of Age-old Problems

Advances in renewable economics help solve these problems:

- The specific heat of water is high, making both hot and cold expensive
- Plants respond well to controlled water and temperature
- Plants respond to photoperiod adjustments, but this is expensive
- Different wavelengths of light at different times matter to humans and plants
- Humans like and need to be outside even if the weather is horrible
- Temporary structures are expensive
- Metals are difficult and dangerous to melt
- Steel is made with coal/coke/carbon
- Mental health gets worse when we are too cold, dark, hot or cramped
- Tunnels are expensive, even though they can be amortised over centuries

In some cases this requires a change in psychology.

Perhaps society needs a commercial incentive to jolt into action?

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# Past Mistakes in Western Europe

Unhelpful statements and attitudes that tend to prevent progress:

- People can manage happily even with an unhealthy daily lifestyle
- Built environment planning should not think 50 years ahead
- Built environment planning should not be temporary day-to-day
- Climate resilience only works at large scale
- There are no Quick Fixes to any of our environmental problems
- Nuclear energy means cheap electricity decades (see Hinkley Point C!)
- Climate responses always mean reducing consumption

This is very depressing psychology. It *feels* like All The Fun Is Over. Or at least We Cannot Fix Anything Ourselves.

Hidden inside renewable energy are a few possible answers to the above.

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# Boundaries of Discussion

To make things easier we assume:

- We are only talking about wind energy
- we only sell to 3 million consumers in relatively remote Nordics+Scotland
- only **LCOE not LAOE calculations** for renewable electricity apply
- wind turbines are already likely to be installed, or at least proposed
- the ***marginal cost of too much renewable energy is low***<sup>1</sup>
- people want to have a nicer life immediately
- good sales staff can use the above psychology ruthlessly
- consumers addicted to ***too much renewable energy*** will help climate change
- We are not discussing sewage. It matter a lot, but is a separate topic.

<sup>1</sup>This is known as Shearer`s law by at least one person

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# Renewable Facts and Quasi-Facts

In the context of these assumptions:

- in 2021, a non-grid-connected 2MW turbine can cost  $\ll$ €1M ex-factory
  - with modern technology a community can absorb as much electricity as is produced, and really enjoy doing so
  - therefore there is no **VRE problem** (Variable Renewable Energy) even locally
  - climate resilience in these communities is expensive for central government
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# Technologies

## Old Technologies Updated with New Use Cases:

- efficient **Reverse Stirling Liquid Air** machines
- cheap **thermal batteries** made on-site from local materials
- improved **thermal distillation** produces water (and is an energy dump, but also produces salts)

## New technologies:

- **tunable horticultural LEDs** are **massively mainstream**, power requirements are dropping and so are prices
  - better aerogels for insulating everything eg **Svenska Aerogel**
  - Almost there... in trials in 2021: **Machine for Low-energy Fertiliser from Air**
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# Abundant Hot Water

Benefits from vast amounts of hot water for soaking, swimming, steaming:

- Rheumatic, digestive, mental and lymphatic health
- Good for auto-immune issues and other degenerative conditions
- Good for age-related conditions
- Community and social cohesion, proven over thousands of years

Hot water used in district/community style distribution benefits:

- Domestic and industrial: all buildings can have the heat they desire
  - Horticulture: heating growing houses such as polytunnels
  - Horticulture: heating ground in the outside air, strange though it seems
  - Civic living: roads and common areas can be heated (like footpaths in Oslo)
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# Abundant Liquid Air

Liquid Air should firstly be configured as a **commercial energy store**.

This is then also a liquid air resevoir, which can be used to make Oxygen and Nitrogen.

Instantly accessible stores of liquid air improves quality of life:

- healthy **winter recreation** no matter what the weather or temperature, at cost comparable to orginary community garden maintenance
  - small-scale **artificial ground freezing** avoids costs and dangers of water and mud, which we expect to increase and become more erratic
  - LN2-assisted **Russian ice bridges**, particularly for short distances in communities that cannot afford civil works, or where they would be destructive
  - Rapid-response initial flood defences
  - Potential for sea calming
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# In 2022 we look forward to...

- **perovskites** making tunable LEDs even cheaper, better and less polluting
  - several **graphene desalination companies** with commercial products, reducing costs enormously and raising the problem of excess salts
  - improved catalysts giving very cheap hydrogen production from water
  - being able to buy a **Unilever nanofactory**
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# What We Can Sell

Where the calculations are favourable, excess wind energy can be found either:

- Immediately, by disconnecting from the grid and applying these loads, or
- Installing extra capacity knowing that base load can always burst to capacity

At this point, communities can then invest in:

- Hot and cold water solutions for health and pleasure, and
- Food production economics turned on their heads

These are the obvious items for both communities and suppliers.

What company will be the first to offer these existing products together with the knowledge to show how they are a holistic fit? Explaining excess energy is hard.

But the market is big, far bigger than just one small part of Western Europe.

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# Next Steps

Validation of this idea:

- Adopt an existing model for renewable economics to take into account new technology and new assumptions as explained above. This is a specialist task.
- Offer this model for peer review.

Identify commercial partners:

- Companies whose sales are limited today by the VRE problem and our ancient distribution grids, or reluctance to try new technologies.
  - Existing manufactures of products mentioned above delighted to have a new positive benefit to sell their customers
  - Food production organisations desperate to explore alternative means of production but not wealthy enough to fund speculative development
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# Why?

The world is burning.

We need to feel immediate positive benefit from climate actions we take.

It is much harder to despair when we feel more healthy and happier.

The thinking of 50 years ago is holding us back – power grid design, old ideas about insulation, prioritising isolated individual living over healthy living, etc.

Where is the urgency? Unfortunately perhaps the only way to find that is to find a commercial incentive.

ENDS

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So What Can We S

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