Reading Drawdown/Work in Progress

A Transatlantic Portable Document

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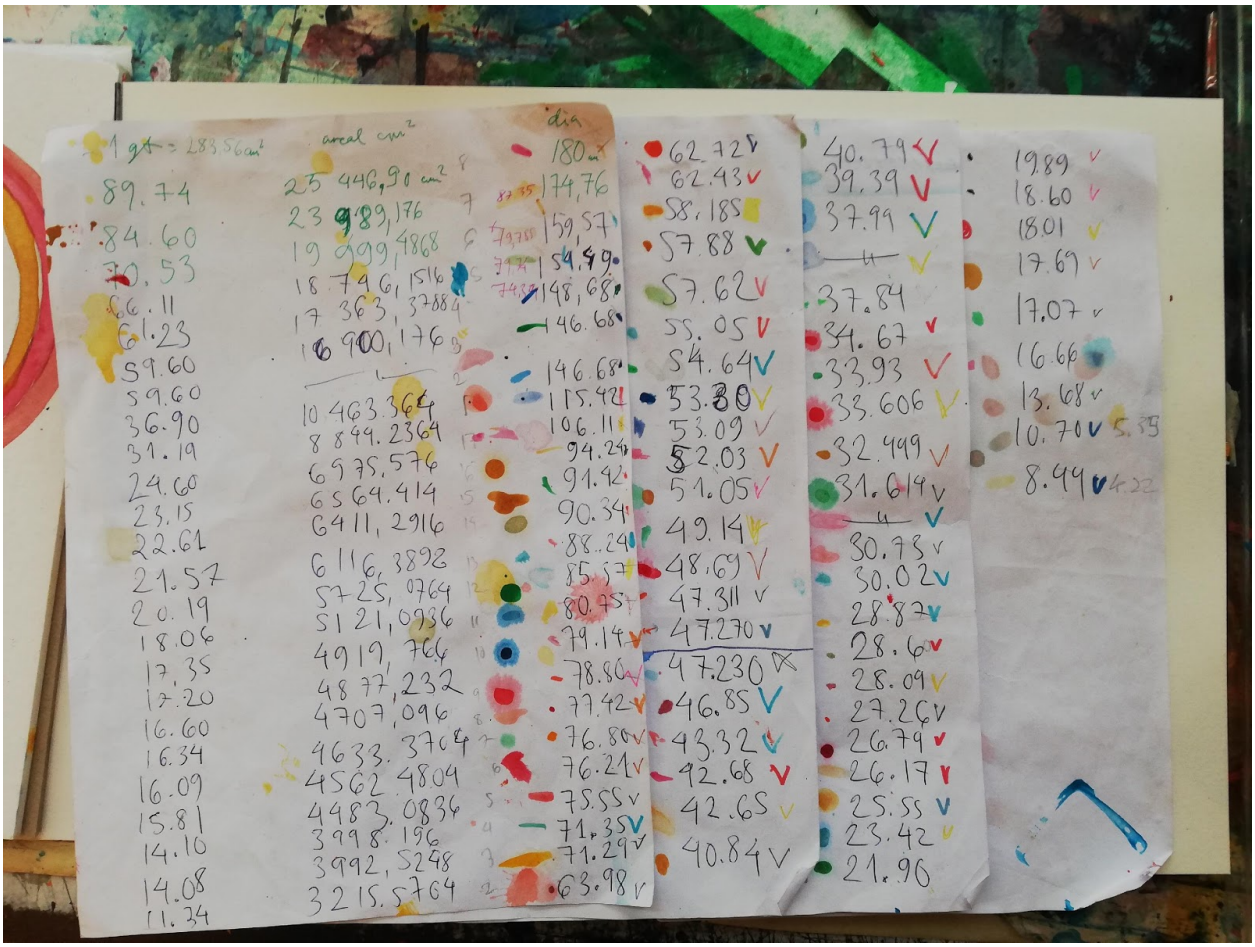
Introduction

Project Drawdown *is a comprehensive plan for reduction of atmospheric CO2 to below 350ppm by 2050. It began as a ten-year long research project, the first to examine what combination of climate solutions would produce adequate carbon drawdown for a safe climate future. The results of the research are organized through a list of 100 ranked solutions based on calculated carbon savings over 30 years. The list encompasses only technologically viable, existing solutions which have an established and peer reviewed body of literature to support findings. The study was compiled by a team of over 200 scholars, scientists, policymakers, industries, and activists.* Project Drawdown's *research summary was published in 2017 and is available at www.drawdown.org.*

Reading Drawdown/Work in Progress: A Transatlantic Portable Document *is a collaboration between Rjukan, Norway-based visual artist Margrethe Kolstad Brekke and Portland, Oregon, USA-based poet Alicia Cohen.*

The poems here are based on the 100 solutions mapped out in Project Drawdown *and its accompanying body of literature (or specific case studies) with one poem for each solution. These poems were first published in 2018 as an audio series on Radio Luftballet www.luftballet.com.*

The art works here draw broadly on data and solutions from Project Drawdown *as well as Sir Thomas More's Utopian alphabet; the United Nations Sustainable Development Goals; the utopian research and theory of Ruth Levitas; Solar Impulse, the experimental long-range solar aircraft project; the Voss Kitemill (Norway) wind energy project and hang gliders produced in collaboration with hang glider designers Icaro 2000 (Italy).*



+

Dedicated to Marthe Reed

+

(counting the moments)

we are lost

A transformation requiring a cup or an inkwell, consensual alienation

We were there

—*Marthe Reed*

For the Next Great Acceleration Patternblock*. Concentric arrangement of Drawdown solutions in a ratio where one gigaton reduction equals 2,835 cm2. Draft, 1 to 10.*

Reading Drawdown, Introduction

+

The wildfire is 7%
contained in the Columbia River Gorge
inside the dawn of solastagia's summer

Walkers on city blocks
nose and mouth obscured under masks + oregon public broadcasting
calls for children and the vulnerable to stay
inside where it is sweltering
and school has started
and nothing is built for this heat
day after day the sun disk-red looms in the eerie grey sky

We tell ourselves the rains will begin again and
many mushrooms will fruit
hiding in a black land
among sweet green shoots

The age of patterns' solar cycle return +
Holocene expectation
blooms uncertain
our moods furred with doom

Again this year is
our hottest and
we measure it

Inside a mass extinction
strain to hear
the fires and floods to come

Today ash from the fires floated in air and
lodged rich in my lungs
as if climate models
had mounted my chest

heavy as a stranded manatee

When I was ten
our class sat in poetry circle on Fridays
with crisscrossed legs
braiding each others' hair or caressing each others' backs listening
as each of us read a poem—
like "The Raven"
or one about trash by Silverstein.

Let's gather together like we do —
to compost history and all this
horror waste into sable loam for a future of
thronging garden flower
habitat and food

May pleasure be our guide *pleasure*
enjoyed equitably
by the children of
all species
for all time

 # 78 Microgrids

| An enabling technology—emissions, cost, and savings are embedded in renewable energy |

The macrogrid is a centralized system where massive plants, which have historically been coal fired, distribute energy across long-distance power lines to individual users. A *microgrid* is a localized grouping of distributed energy sources, like solar, wind, or in-stream hydro, together with energy storage and load management tools.

A solar microgrid
is being built by the community
of Highland Park, Michigan; home to first Ford Assembly Line
factory

The Ford plant closed down and
left town years ago

Debts unpaid—
its loss vacuumed the grand library shut and boarded schools
up; the splendid homes began to decay
as many millions of dollars of debt
to DTE, the electric utility,
amassed —
debts unpaid

I woke up to see a truck removing this huge streetlight.
Then the city was dark at night after that.
They just came and took all our lightposts.
You take it for granted in a city. You need electricity
and light like you need water.

Highland Park is a forested city
of ten thousand people
The trees' root networks go deep
into earth's ancestral layers feeding
green leaves that bud and wave in the sun
feasting in summer's freedom
full of life's debtlessness
and the brilliance of resilience

The Ford plant is derelict
windows strew their glass over decades and
winds flow through
like memories of sorrow like dreams'
radiant tomorrow

In 2011, under emergency financial management, more than two-thirds of Highland Park's streetlights were removed, leaving concrete stumps and large swaths of the city dark at night.

In response to the abdication of basic services, a grassroots organization called Soulardarity formed to relight the streets. Out of a sense of responsibility to people all over the globe who are also vulnerable to climate change, they chose to use non-polluting solar powered street lamps. Soulardarity's goal is to replace all of the city's 1000 removed streetlights with a community scale solar microgrid. The microgrid will provide energy resilience and, through long-term near-zero-cost street lighting, save the community $16 million annually in money leaving the city.

Some debts
we can never repay
as they shine outside exchange
all surplus and eternal
the wild solar infinities of photons cascading to earth's surface nonstop

Bouncing off carbon-form green leaves
their belly-wing shapes lilting in heat

gathering growth
exuding oxygen and our grounds for flourishing

Microgrid networks
of care and support morph into manifest —
neighbors hold each other up to catch morning
sun on photovoltaic plates

Energies expand outward like a
choice is interlinking, a webwinding
proliferation

On this earth every flower is small and
perfumes its season in the sun —
the bees come

Highland Park
pollinators of the
vastest nonviolent movement —
the world-sized wave of transition
nurturing our heart-shaped gardens together
like microgrid communities
shining stored light in the starry vast night

"*It feels good to take that*
power back. We need to focus
on these 2.9 square miles and make it a beautiful city again."
—Nandi Frye

Thank you to the people whose work and words shape this poem: Nandi Frye, Margaret Lewis, Shamayim Harris, Bert Johnson, Maria Thomas, Gerrajh Surles, Jackson Koeppel, Supa Emcee, Ali Dirul, Karanja Famodou, Cindy Mondy, and Jennah Mondy, among others.

AWE Microgrid in Agricultural Context

Liam F1 turbine

#42 Heat Pumps

| 5.2 gigatons reduced CO2 |

Heat pumps could address the world's heating and cooling needs and eliminate almost all emissions if powered by renewable energy. Most people have a variation of a heat pump in their homes already: a refrigerator. Both heat pumps and refrigerators transfer heat from a cold space to a hot one. Heat pumps can supply indoor heating, cooling and hot water—all from one integrated unit. High-efficiency heat pumps reduce fuel consumption to zero and use less electricity to generate heating and cooling.

higher energy molecules evaporate first
leaving lower energy molecules behind
pump pumps pumping
the warmth of the air
through a skinny mouth

flips it
turn the world upside down
pressure and refrigerant and fan
flip it and reverse it
fossil fuels aside slide
opposites oppose
one hot one froze
flow it
pull my switch down flip it and reverse it

step O step O flow to hot hot go so O hot so O slipslip through the
hothothothothot coldcoldcoldcold
isfastisfastisfastis slowisslowisslow
hothothothothot coldcoldcoldcold
isfastisfastisfastis slowisslowisslow
hothothothothototototooocoldcoldcoldcold
isfastisfastisfastis slowisslowisslow
hothothothothot coldcoldcoldcold
isfastisfastisfastis slowisslowisslow
hothothothothot coldcoldcoldcold
needle the straw the small mouth flip it cool so O cold it go O flow

it reverse and it flip down switch my pull
it flow
froze one hot one
oppose opposites
slide and aside set fuels fossil
it reverse and it flip
fan and refrigerant and pressure
down upside world the turn
it flips
mouth skinny a through
air the of warmth the
pumping pumps pump
behind moelcules energy lower the leaving
first evaporate molecules energy higher

#9 Silvopasture

| 31 gigatons reduced CO2 |

Silvopasture is an ancient practice that integrates trees and pasture into a single system for raising livestock. Research suggests silvopasture far outpaces any grassland technique for counteracting the methane emissions of livestock and sequestering carbon under-hoof.

There are two problems with agriculture—
you are trying to keep something alive that wants to die
or you are trying to kill something that wants to live.

Silvopasture thrives from
sheer total utter neglect.

First Identify your biome & keystone species.

Then do earthworks & water management. Water is the one nutrient plants can't do without. Identify one or more key points in the landscape where water accumulates and build a pond to catch a massive rainfall event.

Next establish edible woody polycultures along swales.

Then fences & roads.

No spray.

Ever.

People say “Nothing grows under black walnuts!" but the walnut growers are spending all their time eradicating stuff that grows under them. So encourage or add prunus species: berries, grapes, fungi, forage.

A more-or-less naturally occurring food forest in the Eastern US might begin with oak overstory, then apples, hazelnut, stone fruit, raspberry, grape, currant, gooseberry, forage, animals, fungi. If you plant these in community they cannot fail; they will maintain themselves. Animals are crucial.

Oak savannas evolved to be abusively grazed by mastodons

Livestock in the orchard will conveniently remove low branches like those that convey apple scab. Just move the grazers before they do damage.

Plant apple trees and don’t tend them—
just harvest the low hanging fruit—
let the fruit up high fall and get eaten by your animals.

Daffodils and comfrey suppress grass and rodents below trees yet attract pollinators at just the right time before apples bloom.

Learn the difference
between an observation and a concept—
for example, invasive species is a concept.

The goal is to do as little work as possible—
try planting lots of chestnut trees close together
if they don’t thrive pull them out right away
if they get blight let them die

then the ones that survive
will thrive
no need for fungicides or other inputs

restoration and agriculture need

not be at odds —

manage for eternity

All words for this poem taken from Mark Shepard, author of *Restoration Agriculture: Real World Permaculture for Farmers,* with thanks to Ben Stallings for his notes.

Dye-sensitized solar cells (DSSCs) have become a topic of significant research in the recent years. Natural Dyes from plant and algal pigments can be effectively used in the fabrication of DSSCs; the technology appears promising due to its low cost, flexibility, aesthetic appearance and ease of preparation. “The preparation of natural dye from rose petals, the fabrication of natural DSSC and their advantage over other generation solar cells are emphasized in our research.” — Prabavathy Nagarajan, PSG College of Technology, Coimbatore, India and Asitha Udayanga Malikaramage - University of Peradeniya, Sri Lanka.

#6 Educating Girls and #7 Access to Family Planning

| 120 gigatons reduced CO2 |

Educated girls realize higher wages and greater upward mobility, contributing to economic growth. Their rates of maternal mortality drop, as do mortality rates of their babies. They are less likely to marry as children or against their will. They have lower incidence of HIV/AIDS and malaria. Their agricultural plots are more productive and their

families better nourished. Today, there are economic, cultural, and safety-related barriers that impede 62 million girls around the world from realizing their right to education. The number one solution to global warming, in terms of potential impact? A combination of educating girls and equitable access to family planning, which together could reduce 120 gigatons of CO2-equivalent by 2050 — more than onshore and offshore wind power combined.

You'd think
some technology— electric vehicles, solar,
carbon sequestration—
or the global market
might wield the greatest capacity
for undoing global warming

But these calculations suggest girls and women—
their access to education and to reproductive choice—
hold
the most massive source of
power for drawing carbon
out of our atmosphere.

It is a man who holds the
record for all races
except long distance hikes.

— Vast

of forest or mountain

dessert lands sprawl

and lounge endless to her eye

she sleeps on the trail

fix shoe study

map pot metal hot dinner

journal notes worry

and vista

The Fastest Known Times (FKT)
on the longest hiking trails

are all held by women.
We don’t know why —
perhaps it has to do
with endurance capacities
when stretched over
extended time periods. And —

perhaps feminism is
a crystalline
fact of survival

For the Next Great Acceleration Patternblock*. The 17 colours of the UN SDGs arranged in proportions based on the 17 legs of flight that constituted the Solar Impulse 2 expedition 2015-2016.*

#5 Tropical Forests

| 61.23 gigatons reduced CO2 |

Once blanketing 12 percent of the world's landmass, tropical forests now cover just 5 percent. While destruction continues in many places, tropical forest restoration is growing and may sequester as much as six gigatons of carbon dioxide per year. As a forest ecosystem recovers, trees, soil, leaf litter, and other vegetation absorb and hold carbon. As flora and fauna return and interactions between organisms and species revive, the forest regains its multidimensional roles: supporting the water cycle, conserving soil, protecting habitat and pollinators, providing food, medicine, and fiber, and giving people places to live, adventure, and worship.

forest geophony
dusk chorus

insects acoustic territory
frequency spectrum underpinning
reptiles and amphibian niches

flute wave birds and body drum
mammals bandwidth temporal hollows
orchestral congregation

deforestation distends
in call and response to
economic logics' scything
lives' richness for
markets that externalize
destitution

here we are
7 billion people
415ppm of atmospheric carbon and interminable webs of roads

and the conditions for re-
forestation
exist

education and economic equity's anthrophony
downstream localities
indigenous land rights
families of farm workers
rural communities among standing forest

Pavonine cuckoo
pitch at daybreak
globes of audibility
venture aim and aimlessness

here and now mouth dinosaur wisp
memory
forests the lung
ampimg earth's kinetic aria

(Special thanks to Bernie Krause, bio-acoustician, whose writing and ecosystem recordings inform and underpin this poem.)

#4 Plant Rich Diet

| 66.11 gigatons reduced CO2 |

If 50% of the world's population restricts their diet to 2,500 calories per day and reduces meat consumption overall. And if avoided deforestation from land use change is included, 66 gigatons of emissions could be avoided, making healthy, plant-rich diets one of the most impactful solutions.

1.

there is a
weird miracle —
a branching of
universes
seeded in choice

Choosing to eat
more of this or
of that

A ferocious richness
in choosing
cannot be unfound
or taken away

2.
In my volunteer training at People's Co-op
Pablo told me
this is the best department to work
in the grocery
because everything here
is alive

3.
kale and red radish
ruffled sweet green lettuces
apple and cauliflower

perfume of purple onion perfume of lime

4.
the nuts roasted with salts
the coffees and coconut creams
the beans mixed with lemons
and seed pastes and oils of olives

5.
dipped in round breads
earth's hot wealth
is potlach
under a picnic sky

5.
deliciousness is
earths' rebirth in creation
sticky honeyed ringed rolls cardamom
and cinnamon
ancient floras gathered to powder
over eons
each gathering choice

and there is

a delight in not eating
beings who turn to face us when
we sit at the table of being
on our plant rich
feast earth

Trial, For the Next Great Acceleration Patternblock

Trial, For the Next Great Acceleration Patternblock

#3 Reduced Food Waste

| 71 gigatons reduced CO2 |

A third of all food raised or prepared is squandered generating greenhouse gases at every stage. In regions where income is low, food spoils in fields, during storage or distribution. In higher income countries, retailers and consumers reject food based on bumps, bruises, and coloring, or simply order, buy, and serve too much. If 50% of food waste is reduced by 2050, avoided emissions could be equal to 26.2 gigatons of carbon dioxide. Reducing food waste also reduces deforestation preventing 44.4 gigatons of additional emissions.

Eating everything is my song eating the entirety

to rend and feast remakes me sings

Being engulf and consume

single cells in mushroom-stem burgers dandelion shoot salad

delicious egg pickle sandwich potato pie vinegars enchilada

garlicky avocado spread caraway seeded sour bread

stewed bellpepper and wine paprika Goulash kale and potato hash

mysterious desire time symphony of potlatch

precious music's spheric orientation where hunger appears suddenly

unrelenting it grasps us

as any art will

fesikh lutefisk creamed corns

casserole brown rice breakfast porridge savory purple cabbage salad

bubble and squeak what sings out to a hunger is what's to be eaten

cherished carrots alchemic rods golden fleeting sweetness

beet and leak cobbler berry trifle

opens me to the fretwork root systems under earth

Lancashire hotpot honey mustard

pasta bún bowls and molés

marmalade whiskey butter and bread pudding alchemy uncovered in potpie

blanketed in crepes

loafed in lentil

squirrel it away shepherd's pie

pickling, curing, salting paella pizza frittata

fried rice soupstock chopsuey

soups and curries taste best a bit old tikka masala

quick plum crumble desires

like these reroot root-vegetables

relate us to our starry expansions

our care & attention vibrates inside the earth-

tether of hunger

https://exponentialroadmap.org/

#2 Wind

| 84.6 gigatons reduced CO2 |

The wind industry is marked by a proliferation of turbines, dropping costs, and heightened performance. In most locales, wind is either competitive with or less expensive than coal-generated electricity—and it has no fuel costs and no pollution. Ongoing cost reduction will soon make wind energy the least expensive source of electricity, perhaps within a decade. An increase in onshore wind from 3 to 4 percent of world electricity use to 21.6 percent by 2050 could reduce emissions by 84.6 gigatons.

fly and wind
round to dive in delicious air—
fests of future chitchat parley and huddle in
songs humming up on winds tranquil
and storming flies the crow to carry evident
news

of conversion all is nothing but —

powers

current of air gale zephyr
hear through the grapevine in the air
looming brewing anemometer
wind speed *this road winds dangerously*: TWIST AND TURN, twist,
bend, loop, zigzag, weave, snake, furl,
entwine, lace, loop, unwind, calm down, rest

For the Next Great Acceleration Patternblock, Icaro2000, 2019

#1 Refrigerant Management

| 89.74 Gigatons Reduced CO2 |

Our analysis includes emissions that can be achieved through the management and destruction of refrigerants already in circulation. Over thirty years, containing 87 percent of refrigerants likely to be released could avoid emissions equivalent to 87.9 gigatons of carbon dioxide.

There is something poetic in the fact
that chilling indoor spaces
threatens to turn earth so massively hot.

To prevent a hothouse earth *Refrigerant Management*
is as essential as it is
prosaic—

wind
and solar
and silvopasture
are music-rich words which
poetry constellates fluently
about as if summoning
swarms of sea bubbles or clustering
sunlight illumined diamonds

it is perhaps easier to legislate refrigerants
than to battle Exxon Mobile
but it is tough to make a poem
about refrigerant management

about the work
of adjusting legislation and assembling
legally binding agreements
to reduce HFCs, hydrochloroflurocarbons

about the book length texts
on reducing leaks
in commercial operations

about the hours
to be spent with
tools and wires in hand
tightening and adjusting —
on paperwork
calculating and confirming
recycling processes and measuring losses during
disposal protocols —

terms impoverished of handholds

for
poets to latch onto
but *the plums in the icebox—*
the white chickens beside the red wheelbarrow—

the poetry of our world is made
out of the common stock and small
set tenderly and judiciously together

see how we secure the raft and hold
the beautiful
so much depends
upon

For the Next Great Acceleration Patternblock

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