



## WEEKEND READING

Shedding the light on what's happening - our world - our finances - our times

### Friday the 13<sup>th</sup> Climate Change Blues

The UN Inter-Governmental Panel on Climate Change (IPCC) updated their vision of the planet's future this week. It makes for depressing reading The UN Secretary General's commentary was dire. The report was publicly available Sunday, Aug 9, 2021.

<https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>

<https://www.un.org/sg/en/content/secretary-generals-statement-the-ipcc-working-group-1-report-the-physical-science-basis-of-the-sixth-assessment>

We're likely to see a Federal election this fall. We expect climate change to be a major issue. With this and the IPCC report in mind, we'll focus on climate issues this week.

### Unintended Consequences

We are experiencing drought here in BC. In a worthy effort to conserve our local aquifer and protect salmon spawning in our local rivers, BC Provincial water regulators have curtailed farm irrigation. The fields in our area are bone dry brown.

The Cowichan Valley has experienced a rebound in Roosevelt Elk population. A herd of 70+ lives in our corner of the valley. With no feed up the mountain and no field hay to eat, they are hungry and in search of any blade of grass available. These horse-sized beasts knock down fences, destroy corn crops, trash fruit orchards and mangle country gardens in search of forage. Tuesday AM, we woke to the dogs barking at a Biker Gang of a dozen Elk wrecking our apple orchard. Our pair of Rottweilers took one look at them and decided "uhmm....maybe not". Good thing too as elk will charge humans and kill dogs. Some judiciously distanced yelling and banging on pots sent them over the neighbor's fence. 5:00 AM in the country is never dull.

As the fields dry out, the grass and biome underneath go dormant. If the drought lasts too long the grass dies, taking the biome with it. Less bugs and grubs mean less food for our local bird population. As the fields dry, the air becomes hotter. The trees along the edge of the fields aren't getting water, are stressed, turning into wild-fire kindling. We dug out a pond by our barn. The pond collects water seeping from our field irrigation system. The pond connects to the Koksilah River. Shutting down irrigation dries out the pond, heats the water, increases algae blooms, kills the fish and frogs. Keeping some water on the fields helps reduce these losses. This requires local knowledge and local enforcement of abusers. Dealing with the local realities of each little biosphere is beyond a Provincial Govt's capacities. The solution is a blanket regulation to cease all watering. Attempting to solve one problem often has unintended consequences.

With unintended consequences in mind, a major policy plank in our current Fed and Provincial Govts likely run for re-election is to rapidly increase the use of Remotely charged Plug-in battery-powered electric vehicles (PBEVs). I revisit and update EV power consumption this week.

### ***'Biden's Electric-Car Ambitions Face Real-World Roadblocks' - Wall Street Journal - Aug 8, 2021***

<https://www.wsj.com/articles/bidens-electric-car-ambitions-face-real-world-roadblocks-11628427780>

(may require subscription)

Driving consumes energy. Internal Combustion Engine (ICE) cars burn hydrocarbon fuels. Current ICE technology extracts less than 35% of the latent energy available, pumping the rest out the tail pipe as emissions. PBEVs consume electrical power. PBEV electrical energy consumption (at the tail pipe) looks cleaner. Simple. Switch from ICE to PBEV. Done. Easy to grasp. Easy politics.

The first question is are PBEV's more efficient? For the same capacity vehicle traveling at the same speed in the same conditions, do EV's consume less energy? Mass requires energy to move. Moving 2 tons of mass + occupants at 80 KMH takes a lot of energy. As PBEV's carry a heavy battery pack, they significantly outweigh their ICE cousins. The larger/heavier the vehicle to be moved the heavier battery pack required. The farther the range and/or higher acceleration opted for ('Ludicrous' mode in a Model S), again the larger/heavier the battery pack. The ratio is exponential. How much heavier?

The base 2-wheel drive Ford F-150 weighs 4,012 LBS parked at the curb. The Ford F-150 PBEV 'Lightening' outweighs the ICE version by 1,600 pounds or 40%. The Volvo XC40 SUV ICE curb weight ranges 3,600-3,800 lbs depending on options (luxury = heavy). The Volvo XC40 PBEV 'Recharge' curb weight is 4,741 lbs = 25-31% heavier. That extra weight is an immediate efficiency deficit for EV's. A more powerful ICE engine typically does not have this weight deficit, but it will consume more energy per KM driven. There is no free lunch.

<https://www.cnn.com/2021/06/07/business/electric-vehicles-weight/index.html>

Canada's Driving.ca article 'Home on the Range' discusses the energy efficiency of internal combustion engines and EVs. (see two story links following).

*"Nonetheless, efficiency for an electric vehicle is actually not that much different from gas-fuelled cars, Transport Canada rating, both for how much of something it takes to propel the car in question 100 kilometres. In ICE terms, that something is gasoline — as in, the Toyota Corolla needs 7.6 litres of gas to travel 100 kilometres. In EVs, it's kilowatt-hours — hence the Tesla Model 3 Standard 'Range Plus' official rating of 14.9 kWh per 100 kilometres. Substitute free electrons (kWh per 100 kilometres) for 93 octane (the L/100 kilometres we're all familiar with) and the ratings are virtually identical."*

<https://driving.ca/column/how-it-works/how-it-works-making-sense-of-ev-specifications>

<https://driving.ca/features/feature-story/home-on-the-range-these-are-the-evs-with-the-best-driving-range>

The kWh per 100 KM ratings posted in the above Driving 'Home on the Range' story average 17-18 kWh per 100/KM. Larger/heavier luxury vehicles have higher energy consumption per KM. Tesla's luxury sedan 'Model S' comes in at 21.6 kWh/100KM, Tesla's SUV 'Model X' at 20 kWh/100KM, Audi 'e-Tron 55 quattro' at 28.5kWh/100KM. Recall these are Transport Canada figures that, like ICE MPG fuel ratings, understate power consumption in real world driving. Speed, driver behaviour carload, weather, and external temperature (heaters consume lots of energy) will vary the results. Few drivers achieve the Transport Canada MPG ratings. Few will achieve posted PBEV efficiency either.

## How to put these figures into context? What are the implications?

Canada's National Energy Use data-base shows nation wide average household electrical power consumption. The data is always 3-4 years behind. The data is for 2017. EV adoption has not impacted these figures...yet. In 2017 the avg Canadian household consumed 1,110 kWh per month/37 kWh per day. In British Columbia the higher average winter temperatures and less summer air-conditioning use has the daily average household electrical power use around 27-28 kWh hours. Higher income households with larger building footprints, more bathrooms, larger garages, luxury appointments and fancy do-dads, consume more power.

<https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=SHCMA&sector=aaa&juris=ca&rn=19&page=1>

A round-trip commute, Duncan to Victoria is 121Kms. Transport Canada says the average PBEV making a daily drive would consume 18 kWh+in power. That's the average. There's a wide range. For details of current EV offerings including range and efficiency (European stats) see here:

<https://ev-database.org/>

The above EV-database website's EURO area data (note European weather) uses a 'watt hours per kilometer' convention. To equate to North American residential power consumption data

conventions of kilowatt hours (kWh) we place a decimal point in the EV-database ratios shown.  
 $155\text{Wh/km} = 15.5\text{ kWh/100km}$ .

It's important to understand the range of differences in energy efficiency of battery-EVs. The Tesla Model 3 'Long Range' model shows an above-average 'efficiency rating' of 15.5kWh/100KM. The Tesla Model 3 'Performance' model (which everyone buys) shows 16.2 kWh/100 average = 4.5% higher.

The Model 3 'Performance' shows 17.3 kWh/100K in mild-weather highway driving vs. 22.4 kWh/100K in cold-weather highway driving. In this data base 'Cold Weather' means a worst case of driving in -10 Celsius. Hmmmmm.

The same commuter driving the same route at the same speed will consume 30% or energy in the winter (at no colder than -10C) than in the summer. Both figures are well above the posted 'average'. Wonder what happens in Edmonton at -30C? (!). Winter also sees higher baseload heat and light demand in colder climates. This is starting to get complicated

For each all-battery PBEV vehicle in the household, a daily commute of 120Kms will consume 2/3rds of that household's non-transportation electrical power use. The average family has 1.5 vehicles. 1.8 in the USA. It is easy to imagine household electrical power consumption at least doubling under the 'everyone drives a PBEV' scenario.

Households consume 33.1% of Canada's existing power consumption and 31% of total production. Doubling this figure takes us to over 2/3rds of Canada's current power supply, This assumes no population growth, no economic growth. Add commercial vehicle use/transportation, air travel, rail, ocean going shipping and industrial applications, etc. We attempting to replace hydrocarbon fuels with all-electrical remotely supplied power implies a huge increase in electrical power supply to meet the demand.

So, you need to charge your PBEV. Where's the charging station? US Gas Stations and convenience stores are wrestling with the installation costs.

### ***'Gas Stations Face Tough, Costly Choice on EV Chargers' - Wall Street Journal - Aug 10, 2021***

<https://www.wsj.com/articles/gas-stations-face-tough-costly-choice-on-ev-chargers-11628600400>

(may require subscription)

### **Where does Canada's existing electrical power come from?**

Canada, with it's small population and abundant water, is among the world's highest %'g of total installed electrical power from hydro-electric dams.

Natural Resources Canada 2019-2020 Energy Fact book tells us Canada’s electrical power generation represents 3% of world total. We are however the 2nd largest exporter, with electric power exports representing 7.4% of power generated in Canada, all exported to the US. Most of the exported power is sourced from hydro-electric under long-term contracts. We needed those contracts to pay the huge upfront costs of building dams.

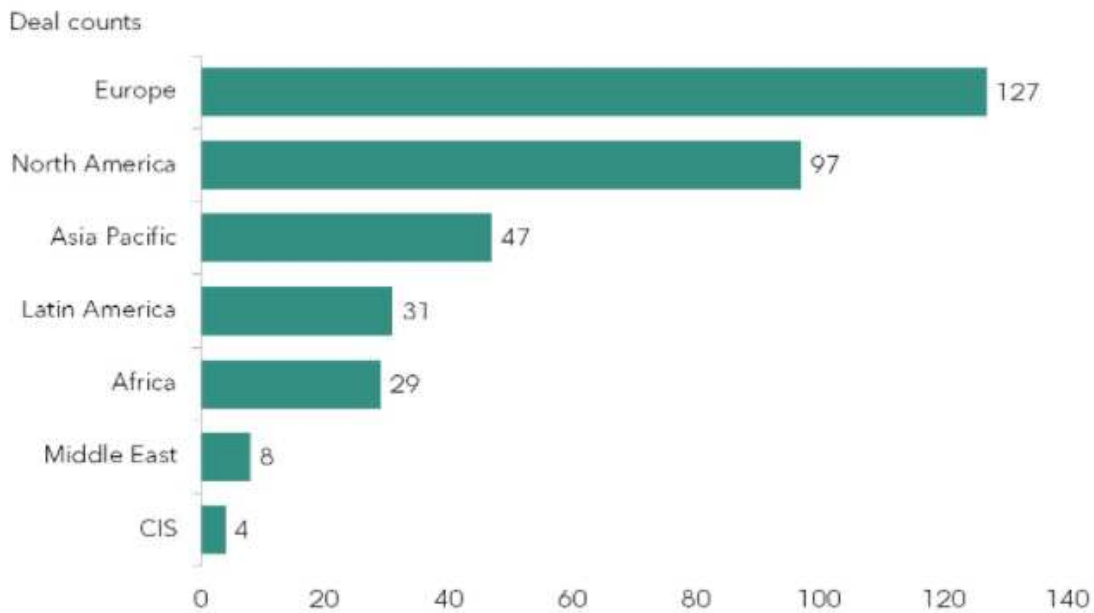
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Unlike hydrocarbon fuels, most of Canadian electrical power is provided by Provincial Crown Corporations, heavily subsidized by the taxpayer and regulated by politicians who must seek re-election. 60% of Canada’s existent electrical power is provided by hydroelectricity. 12% of that power is sold to the US. Is expanding hydropower politically feasible? Which party could run on a platform of damming up more rivers? Nuclear makes a lot of sense but again is politically fraught. I’m not confident ‘renewables’, ex-hydro, are capable of delivering the steady state power required to power 1.5 PBEVs per household.

Accepting the currently widely held belief of *The End of Oil* sometime soon, oil & gas are un-investable (a new word) and must be divested. This has been happening...in Europe and North America.

**O&G divestments by region:**

**International oil companies divestment deal count by region**



Source: BloombergNEF, Bloomberg

Note: CIS= Commonwealth of Independent States. Companies included in the analysis are: Royal Dutch Shell, BP Plc, TotalEnergies, ExxonMobil, Chevron, ConocoPhillips, Equinor ASA, Eni SpA and Repsol SA.

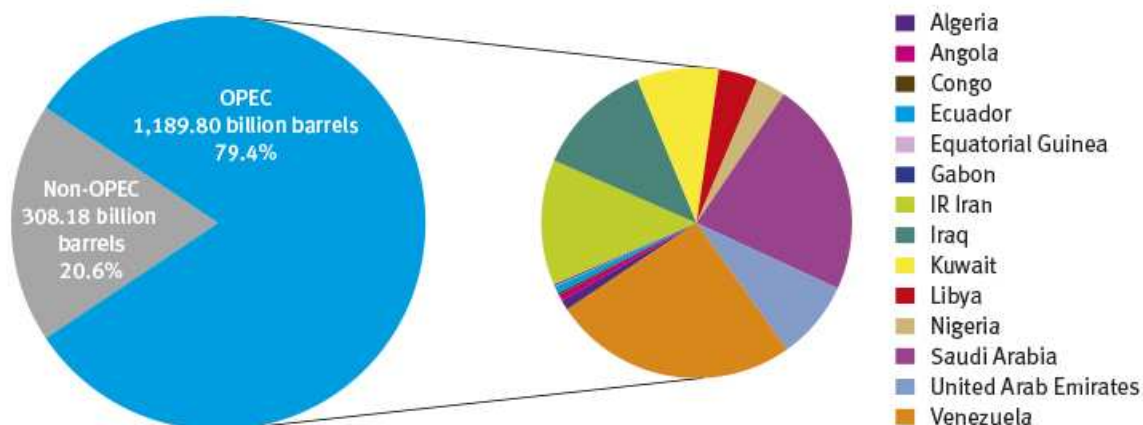


Europe is leading the chart on divestments when looking at more than 300 divestment deals from the world's nine largest international oil companies between 2015 and 2020. Energy investors conventional and alternative should understand the make up of oil supplies.

Each 'divestment' deal means someone bought the assets. Who controls oil supplies now?

In 2018 international oil companies ('Majors' like Exxon) controlled 12% of all reserves. OPEC currently holds roughly 80% of proven reserves. Russia (4.8% of reserves) is not an OPEC member. OPEC +Russia controlled 85% of reserves in 2018. That ratio has likely increased over the past 3 years under divestment programs. Who is OPEC anyway?

### OPEC share of world crude oil reserves, 2018



OPEC proven crude oil reserves, at end 2018 (billion barrels, OPEC share)

Venezuela	302.81	25.5%	Kuwait	101.50	8.5%	Algeria	12.20	1.0%	Gabon	2.00	0.2%
Saudi Arabia	267.03	22.4%	UAE	97.80	8.2%	Ecuador	8.27	0.7%	Equatorial Guinea	1.10	0.1%
IR Iran	155.60	13.1%	Libya	48.36	4.1%	Angola	8.16	0.7%			
Iraq	145.02	12.2%	Nigeria	36.97	3.1%	Congo	2.98	0.3%			

Source: OPEC Annual Statistical Bulletin 2019.

[https://www.opec.org/opec\\_web/en/data\\_graphs/330.htm](https://www.opec.org/opec_web/en/data_graphs/330.htm)

Scrolling down the above list I don't see a particularly ESG oriented crowd.

### Exploring the carbon markets.

National Bank's Index/ETF/Program Trading team published their weekly **Market Microstructure Update** (see attached PDF) yesterday and this week's commentary included a dive into the carbon markets starting on page 2. There is a general overview on the carbon market (compliance allowances, voluntary offsets) including ways for investors to get exposure to carbon markets. They highlight the **KraneShares Global Carbon ETF (KRBN-US-\$36.87)**.

<https://kraneshares.com/krbn/#>

The fund trades on US exchanges in US dollars, tracking an IHS Markit carbon credit index, replicating the benchmark by holding futures on European Union, California, and RGGI allowances allocated on a liquidity-weighted basis. The ETF went public at \$20 in July/2020. The price is up 84%.

**DISCLOSURE: We hold no position in KBRN. We have not traded in the security.**

### **My beliefs on an energy transition, current energy supply/demand.**

- There is a strong desire by Canadian voters to ‘Do Something’ about climate change.
- Wanting change and wanting to pay for it are not the same.
- Politicians tell us what we want to hear. They say Internal combustion engine (ICE) cars are on the way and the End of Oil is near. Dates are vague. Voters like this idea.
- Oil and gas producers and the pipelines that transport both have become a Great Evil and are now un-investable by many large institutions. Prices have fallen.
- Management teams of publicly traded corporations that resist the ESG narrative find themselves unemployed. The pressure to divest has been enormous. The higher profile the target, the more pressure. Politicians have made it any easy to understand *‘it’s all Exxon’s fault’*. Going private solves the publicity problem.
- The exit of investors from publicly held companies and the exit of those companies from hydrocarbon fuel production, all of whom are based in liberal Democracies, hands control of the existing energy supplies to OPEC + Russia. OPEC’s strategy in 2016-2029 was to drive US shale out of the supply competition. It worked. These folks’ thoughts about how the world should work differs from democracies.
- As Japan discovered in WW2 losing control of one’s energy supply is a problem.
- Unless/until a viable replacement for hydrocarbon fuels is available to all of us, at economically viable costs, energy security may become a thing. If that thought suddenly becomes more widespread, remaining publicly owned companies with hydro-carbon assets could suddenly be very popular. The exit of international money from Canada has handed those assets to Canadian owners at low prices. If oil prices rise, Canadian riches could ensue. The Loonie should benefit. This is not consensus.
- Many Canadian oil & gas companies are priced to bear 20-25% cash flow yields. Borrowing at 5% cost, a leverage takeover would be repaid in under 5 years. Even if oil demand goes flat in 10 years the total return would be 20% per year for 10 years. The risk is zero after 5-years. I believe this will (eventually) result in take- overs or privatizations of Canadian oil and gas companies at much higher prices than today.
- This doesn’t mean I ‘like’ oil & gas. I don’t have a belief system to support.



## My beliefs specific to EVs:

- While battery technology advances will increase range, reduce recharging times and unit costs, power consumption, efficiency per-km driven appears unlikely to fall much if at all. The remotely charged, all-battery solution requires significant increases in electrical power production. A double+ for household demand.
- The reality and cost of the implied increase in electricity generation to power battery EVs will prove a challenge for developed nations. It will be impossible for developing economies. India has already said so.
- Two neighbors, (who don't know each other) both purchased a used Nissan Leaf, 2 years ago. Both are retired. Neither drive much. Both advised they are disappointed in the range and charging experience. Both say Victoria/return is risky. This week, they both advised they're selling their Leafs. Both say their next vehicle will be a used ICE powered car.
- PBEV efficiency, being close to ICE doesn't solve the efficiency problem and creates others.
- To accommodate PBEV power demand, power utility companies will either be forced to charge higher rates for electricity across the grid and probably MUCH higher rates for transportation use, or governments will be forced take on debt to shield their voters from this reality. The first is inflation. The second is debt. Inflation feeds debt costs (see my comments from last Friday). Eventually debts matter.
- Battery-EV's seem at best a partial solution.
- Onboard power generation vs. external power plug-in makes sense. Hydrogen seems a viable option. This could be an exciting potential.
- Natural gas fired electrical power combined with carbon capture storage (CCS) could change the narrative on natural gas-powered electrical utilities. Converting coal to Nat-Gas/CCS power seems a much more likely option. Gas isn't going away. Canada has lots of natural gas.
- 'Net-Zero 2050' targets will be altered/softened to reflect political and real-world reality. Remember those '2020 Vision' political campaigns?  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2661927/>

It was interesting to see what financial markets did with this week's IPCC predictions.

- The UN-IPCC report became publicly available Sunday Aug 9, 2021. The attached UN Secretary General's commentary was dire.
- The S&P500 closed Friday Aug 6, 2021 at 4,436. The UN-IPCC report was available prior to the opening on Monday this week. The S&P500 hit a record high today of 4,468

The lack of price response implies either the majority of investors weren't paying attention (unlikely given the media coverage) or aren't convinced the future will be as bad as projected.





I'm not a climate scientist. I'm not, repeat not, saying the IPCC facts aren't correct and I'm not saying their predictions for the future won't be as dire as predicted. On a local level we've seen extreme weather. I'm looking out my window, the sun is unable to penetrate the smoke from interior fires. On a personal level I worry about the impact of human consumption. During the spring of 2020 when the world was largely shut down, the air was notably cleaner and the weather cooler....

## What are we doing with this? How are we invested?

- We are watching the price/risk/reward trade-off between owning current-era energy companies (oil and gas) vs. the portended demand slope for alternatives. We lean towards the exit on oil & Gas but not today. So far, it's been a profitable place to remain. While prices for the stocks of alternative energy names have risen recently, the profits needed to support those prices haven't arrived yet. They might. Overpaying for the future is the way to poverty.
- We're watching Chinese and Indian electrical power/natural gas and coal demand. The Financial post pointed out this week China is relaxing coal policy, restarting 15 coal mines and has expanded 38 more in Mongolia.
- While batteries clearly will have a place, their use will focus on emergency and power modulation not as full power storage sources.
- In transportation, if as I suspect, hydrogen fuel cells prove popular, PBEV adoption could be lower than expected. This could impact the projected need for battery capacity impacting demand for lithium, other rare-earth metals and copper. We are avoiding pure-battery related stories for now. This could change.
- We believe the few non-Govt owned, publicly traded power companies in Canada make great investments. We are invested accordingly. It's worked out well
- Toyota thinks hydrogen fuel cells make sense. We own Toyota. It's worked out well.
- Oil producers are cheap. While the demand slope for crude is a question, natural gas + CCS implies gas producers and related pipelines will be in business for a long time. We own this space for clients. It hasn't been easy but it's profitable. This may be just the beginning.
- I believe climate change risk mitigation policies vs. a focus on carbon reduction will come to the fore in Canada. Spending money on helping Canadians deal with the current risks - forest/urban interface, flood risk, water use efficiency, fire containment, etc. makes more sense than subsidizing high income earners car buying habits.
- My thoughts on hydrocarbon fuels and related infrastructure doesn't mean I'm a fan, nor are we betting the farm on oil & gas. Exiting carbon fuels at some point may make sense but as BB King advises...

<https://www.youtube.com/watch?v=GGc3O2aRuOc>



## How Concerned Are You About Inflation | Which Investor is Most at Risk



Watch Anna's latest video here

<https://www.youtube.com/watch?v=V3XlejfuOpU>

### ***'Magic Beans' – Josh Brown - Aug 9, 2021***

Josh explains why obsessing over 'macro' events is a common investment mistake. This explains why we don't believe knowing where the economy, market, gold, real estate, politics, etc. are headed is particularly useful. The effort is entertainment – being the actual business of the news media – but is often costly.

<https://thereformedbroker.com/2021/08/09/magic-beans/>

### ***'Hanging By A Thread' – Morgan Housel - Aug 13, 2021***

We'll close with a comment on how little events can have huge consequences.

My take is that the future, despite what we think we know, is a mystery. It's been a great mystery for all of us and, despite the alarming headlines for the future of our planet this week, I remain optimistic for the future. On the other hand, repeated painful lessons, banged shins and a sore behind remind me to not overpay for a future that is uncertain. How defensive is the idea? How sensitive to a reversal is the holding? How much of the future is already in the price? Experience tells me caution has an opportunity cost and sometimes that opportunity missed could have been life-altering event. There are many stocks I didn't own, didn't own enough of or owned and sold too soon that if held on

would have made me a very rich man. Those stories make great conversations. There's a lot more that would have ruined me. Those stories aren't told very often.

The main point is to be carefully optimistic. New market highs this week!

<https://www.collaborativefund.com/blog/thread/>

There will be no Weekend Reading from my desk for the next two weeks as I take a summer break.

**Steve & Anna Hilberry**

**Have a Great Weekend!**

[Anna Hilberry's YouTube Page](#)

[NBF – Hilberry Group website](#)



**FOR THE RECORD August 13, 2021**

DOW INDUSTRIALS:	35,515
S&P 500:	4,468
S&P/TSX COMP:	20518
WTI:	\$68.03
LOONIE IN \$USD:	\$0.7989 \$US

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