

Clean energy technology & disinformation with Professor Mark Jacobson



Governments, companies, communities want to be certain which technologies really are green in the face of sophisticated disinformation efforts.

Professor Mark Jacobson and host Bruce Nagy expose disinformation strategy used by fossil fuel interests in academic journals, mainstream and social media.

Participants receive accurate info on hydrogen, carbon capture, nuclear, biomass, biofuel, wind, water, solar, storage, electrified transportation and clean building systems.

WED MAY 11, 2022 7:00 PM EASTERN / 4:00 PM PACIFIC



Clean Air Partnership

CLIMATE SOLUTIONS WEBINAR SERIES



TODAY

MARK JACOBSON PhD

**Professor of Civil and Environmental Engineering
and Director Atmosphere/Energy Program, Stanford University, California**

- ◇ PEER REVIEWED BLUE HYDROGEN STUDY & JOURNAL MISBEHAVIOUR
- ◇ MYTHS & FACTS ABOUT HYDROGEN, CCS, NUCLEAR & ETHANOL
- ◇ MYTHS & FACTS ABOUT 100% WIND, WATER, SOLAR & ELECTRICITY STORAGE

BRUCE NAGY

Climate Solution Group, Toronto

- ◇ ABOUT MARK JACOBSON
- ◇ INTRO TO CLIMATE SOLUTIONS DISINFORMATION
- ◇ MYTHS & FACTS ABOUT BUILDINGS
- ◇ MYTHS & FACTS ABOUT TRANSPORTATION



TODAY'S GUEST PRESENTER
MARK JACOBSON PHD



MARK JACOBSON'S ACHIEVEMENTS ARE SO NUMEROUS IT IS DIFFICULT TO AVOID LEAVING OUT SOMETHING IMPRESSIVE.

PROFESSOR OF CIVIL & ENVIRONMENTAL ENGINEERING AT STANFORD, DIRECTOR OF THE ATMOSPHERE/ENERGY PGM, SENIOR FELLOW OF THE WOODS INSTITUTE FOR THE ENVIRONMENT, SENIOR FELLOW OF THE PRECOURT INSTITUTE FOR ENERGY, CO-FOUNDER SOLUTIONS PROJECT, 100.ORG, AND THE 100% CLEAN, RENEWABLE ENERGY MOVEMENT.

HE AND TEAM HAVE DEVELOPED DETAILED PLANS FOR 100% RENEWABLES FOR 145 COUNTRIES, INCLUDING CANADA, AND ALL 50 OF THE UNITED STATES. ADVISES WHITE HOUSE ON PROVEN TECH & WAS PRINCIPAL TECH WRITER FOR MUCH OF GREEN NEW DEAL.

HAS PUBLISHED 5 TEXTBOOKS AND 175+ PEER-REVIEWED JOURNAL ARTICLES. HAS TESTIFIED 4 TIMES FOR U.S. CONGRESS. NEARLY A THOUSAND RESEARCHERS HAVE USED COMPUTER MODELS HE HAS DEVELOPED. HAS EVEN APPEARED ON DAVID LETTERMAN TALKING ABOUT RENEWABLES STRATEGY.

SELECTED PRIZES: THE AMERICAN METEOROLOGICAL SOCIETY HENRY G. HOUGHTON AWARD, AN AMERICAN GEOPHYSICAL UNION ASCENT AWARD AND GLOBAL GREEN POLICY DESIGN AWARD, A COZZARELLI PRIZE FROM THE PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, THE JUDI FRIEDMAN LIFETIME ACHIEVEMENT AWARD, IN 2022 HE WAS THE VISIONARY CLEAN TECH INFLUENCER OF THE YEAR AT THE WORLD CLEAN TECH AWARDS.

***Thank you to MARK JACOBSON
and also to Gaby Kalapos & webinar manager Juliet Rennick from the Clean Air Partnership.***

BRUCE (BF) NAGY CLIMATE SOLUTIONS

- ◇ AUTHOR 250+ ARTICLES
ON CLIMATE SOLUTIONS
- ◇ AUTHOR *THE CLEAN ENERGY AGE*,
ROWMAN & LITTLEFIELD
- ◇ STUDYING CLIMATE SOLUTIONS SINCE 2003
- ◇ INTERVIEWED HUNDREDS OF EXPERTS
- ◇ FEATURES IN MAINSTREAM MEDIA LIKE NY TIMES & GLOBE AND MAIL AND ALSO PUBLICATIONS READ
BY BUILDING, CIVIL, TRANSPORT ENGINEERS, ARCHITECTS, URBAN & GOVERNMENT PLANNERS.
- ◇ CONSULTANT TO GOVERNMENTS, CORPS, RESEARCH / EDUCATION ORGS
- ◇ EACH YEAR I TRAVEL TO 20-30 NA CLEAN ENERGY / CLEAN WATER / REFRIGERATION PROJECTS.
- ◇ INTERNATIONAL ECONOMICS & CLIMATE - RYERSON U, HARVARD, STANFORD.

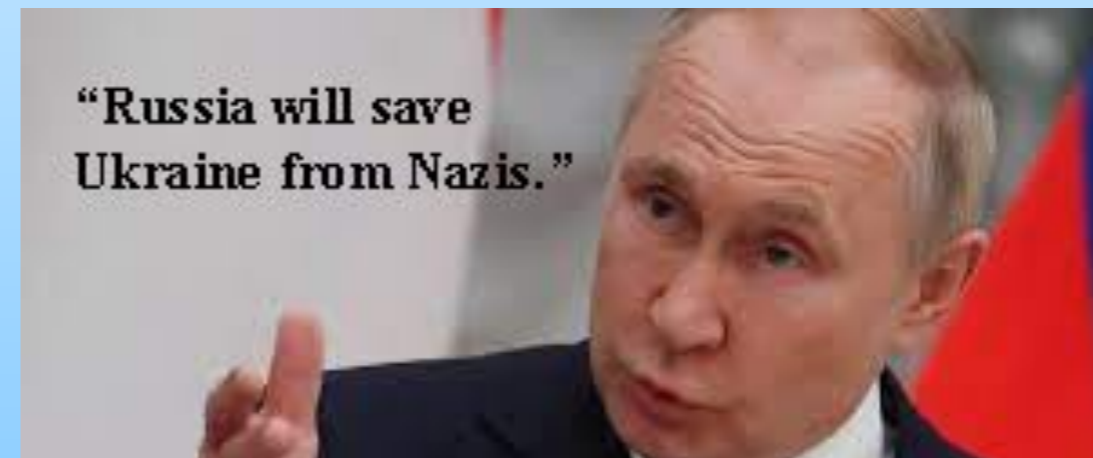


WHY DOES DISINFORMATION MATTER?

DISINFORMATION LEADS TO DEATH & SUFFERING

- ◇ COVID-19
- ◇ WAR IN UKRAINE
- ◇ CLIMATE CHANGE
 - EXISTENTIAL CRISIS
 - INDOOR & OUTDOOR AIR POLLUTION KILLS 8 MILLION ANNUALLY (WHO)
 - INTENSE WEATHER EVENTS, UNNECESSARY FATALITIES
- ◇ WE UNDERESTIMATE WILDFIRES
- ◇ DEFY STORM EVACUATION ORDERS
- ◇ TRY TO DRIVE ON FLOODED ROADS

In November 2021 U of Sussex researchers found posts downplaying or denying the climate crisis on Facebook have received up to 1.36m views.



UNNECESSARY DEATHS FROM INTENSE WEATHER

IN MAYFIELD KENTUCKY 80 PEOPLE DIED IN 2021
DESPITE PRECISE PREDICTIONS ABOUT THE
HURRICANE DANGER & TIMING.

DOPPLER & SATELLITES HAVE IMPROVED PREDICTIONS
FROM 52% TO 97% ACCURACY.

HALF THE 117 PEOPLE WHO DIED IN SUPERSTORM
SANDY ISSUED **MANDATORY EVACUATION ORDERS**
BUT THEY DIDN'T BELIEVE THE EXPERTS,
STAYED HOME AND WERE KILLED.



“Many people facing a weather threat get confused and overwhelmed by the deluge of information and uncertainty. Social media has given the public greater access to warnings and forecasts, but it also amplifies bad information and misguided opinion.”

- *The National Oceanic and Atmospheric Administration, reported in Scientific American*

WHY DOES CLEAN TECH DISINFORMATION HAPPEN?

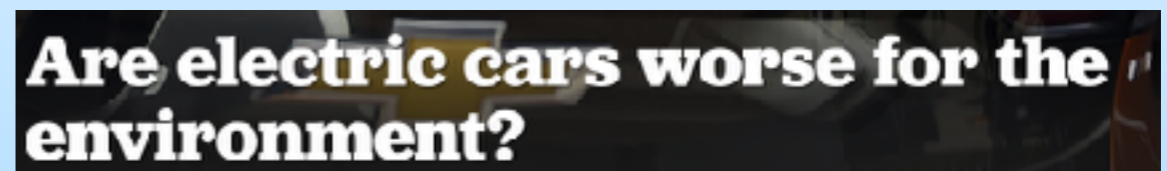
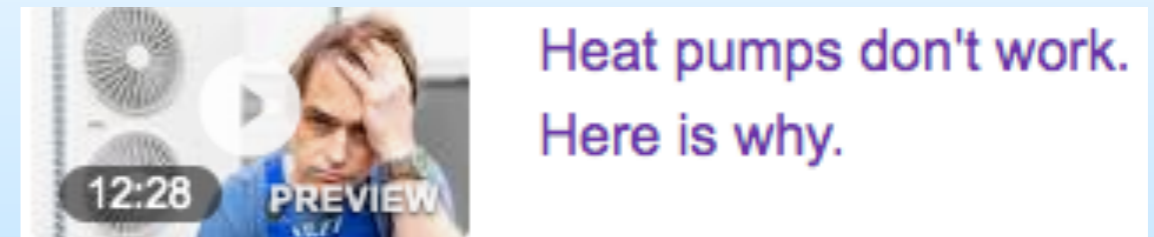
ABOUT 80% IN MOST COUNTRIES WANT TO END FOSSIL FUELS

-BUT DISINFORMATION USED BY POLITICIANS TO JUSTIFY DELAYS & PRESERVE POLITICAL PARTY DONATION REVENUE FROM BIG OIL & BIG NUCLEAR.

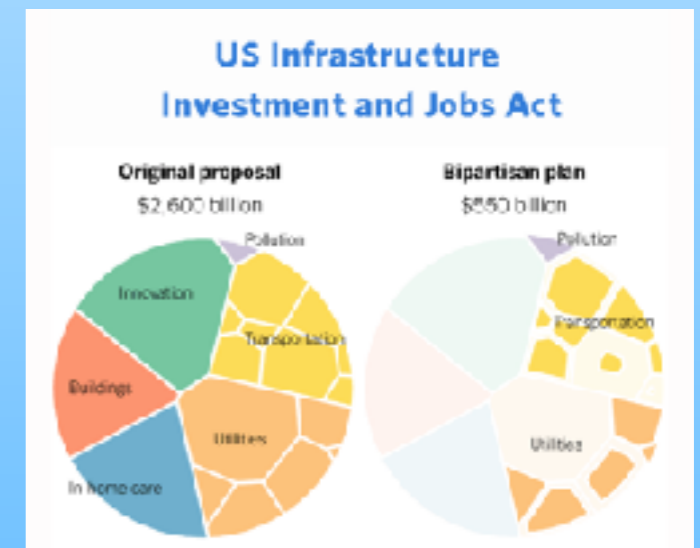
TO SECURE PASSAGE, US INFRASTRUCTURE BILL INCLUDED \$30+ BILLION FOR TECH TO APPEASE FOSSIL FUELS.

US BUILD BACK BETTER CLIMATE LEGISLATION BLOCKED BY SENATOR JOE MANCHIN WHO INVESTS IN COAL COMPANIES.

RESEARCHERS: FROM 2011 - 2018 CANADIAN FOSSIL FUEL INDUSTRY MADE 11452 GOVT LOBBYING CONTACTS, ABOUT FIVE TIMES HIGHER THAN ENVIRONMENTAL GROUPS.



Big oil strategy: Messaging has shifted from climate denial to delaying the energy transition thru confusion about tech. Greenpeace estimates the fossil fuel industry spends US \$200 billion yearly to block climate legislation.



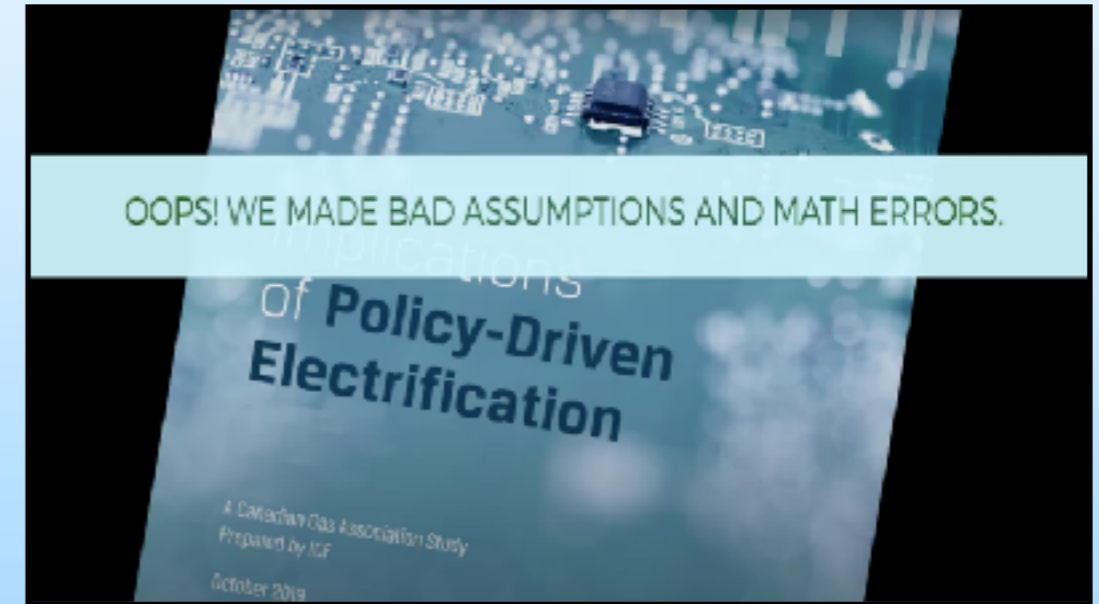
CANADIAN GAS INDUSTRY MISBEHAVIOUR

IN 2019 CANADIAN GAS ASSOCIATION COMMISSIONS REPORT FROM ICF CONSULTANTS, CONCLUDES THAT TRANSITION FROM GAS TO HEAT PUMPS WILL BURDEN ELECTRIC GRID.

DEEPLY FLAWED REPORT IGNORES HEAT PUMP EFFICIENCIES, CASE EXAMPLE IN OSLO, WHERE ELECTRICITY USE **DECREASED** WHEN THOUSANDS OF HEAT PUMPS DEPLOYED. ALSO MAKES SLOPPY **ONE BILLION DOLLAR** DOUBLE-COUNT MATH ERROR.

MISTAKES SUBSEQUENTLY IDENTIFIED BY CONSULTANT, DUNSKY. EMBARRASSED ICF TRIES TO HUSH IT UP.

GAS ASSOCIATIONS IN ONT & NY CONTINUE PROMOTING FLAWED ICF DOCUMENT WITH GOVERNMENTS, AS IF NOTHING WRONG DISCOVERED.



BUILDING TECH FACTS

"HIGH EFFICIENCY FURNACES" ARE NOT IN ANY WAY CLEAN ENERGY.

HEAT PUMPS ARE 300% & 400% MORE EFFICIENT THAN FURNACES / BOILERS.

HEAT PUMPS HAVE NOT STRESSED THE ELECTRIC GRID WHEN WIDELY DEPLOYED.

SMART CONTROLS, LOAD MGMT SOFTWARE, DEMAND MGMT, BATTERIES / STORAGE, MICRO-GRIDS, VIRTUAL POWER PLANTS, EFFICIENCY INVESTMENTS WILL SUPPORT HEAT PUMP SHIFT.

YES AIR SOURCE HEAT PUMPS STILL A BIT CHALLENGED IN COLD WEATHER, BUT TECH & BUILDING ENVELOPES MUCH IMPROVED. NO CONCERN FOR EXPERIENCED HEAT PUMP ENGINEERS & TECHS.

TOP CHEFS AND ORDINARY PEOPLE LIKE COOKING ON ELECTRIC INDUCTION STOVETOPS AS MUCH AS GAS STOVES.



HYDROGEN FOR BUILDINGS IS LAUGHABLE

GAS COS. SECURE MORE 'RESEARCH' DOLLARS TO BLEND HYDROGEN IN EXISTING GAS MAINS.

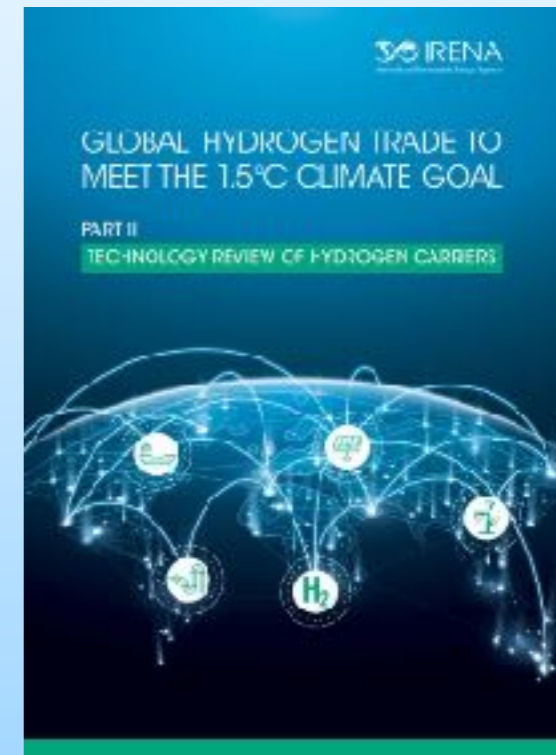
INTERNATIONAL RENEWABLE ENERGY AGENCY (IRENA) WARNS IT WILL COST MORE THAN **\$US 500** PER TONNE OF EMISSIONS ABATED.

ESTIMATES FOR BLENDING EMISSIONS CUT: 10% OR 20% MAX.

ELECTRIFICATION FAR LESS COSTLY PATH FOR EMISSIONS CUT, CAN ACHIEVE 100%.

SAFETY CONCERNS, ADAPTATION COSTS DOWNPLAYED (PIPES, VALVES, CONDENSERS REPLACED).

GAS COMPANIES TRYING TO DELAY & CONTROL THE ENERGY TRANSITION NARRATIVE.



TRANSPORTATION FACTS

ELECTRIC VEHICLES (EVs) FAR CLEANER THAN FOSSIL VEHICLES, EVEN WHEN ELECTRICITY STILL NOT CLEAN.

EVs ARE **5 TIMES MORE EFFICIENT** THAN FOSSIL FUEL VEHICLES (77% VS 13%), WON'T STRESS GRID WHEN WIDELY DEPLOYED.

EVs ALREADY LESS COSTLY, FAR LESS DAMAGING THAN FOSSIL VEHICLES. COST ABOUT 65%-80% LESS FOR FUEL & MAINT. PURCHASE PRICES ABOUT THE SAME AS GAS BY 2024.

LESS THAN 20,000 HYDROGEN VEHICLES SOLD EACH YEAR GLOBALLY, COMPARED TO 6,500,000 ELECTRIC CARS.

BATTERIES DON'T MUCH LOSE CAPACITY, WARRANTED FOR 8 YEARS. LOSSES UNDER 10% BY THEN.

ONE NEGATIVE TRUE: EV TRAVEL RANGE STILL REDUCED IN COLD, BUT AUTOMAKERS WORKING ON IT.

AAA STUDY 2020
Operating costs + ownership costs
15,000 miles per year (24,000 km)

Gas minivans	\$.6734 per mile
Electrics - mostly not Tesla	.6079
Average all cars	.6374

True Cost of Electric Vehicles

YOUR DRIVING COSTS 2020

AAA Average Costs Per Mile

Vehicle Type	2019	2020	2021	2022
Average Total	\$0.6374	\$0.6079	\$0.6374	\$0.6374

Driving Costs

Category	Gasoline	EV (Electric)	Hybrid	Plug-in Hybrid	Electric
Operating Costs	\$0.50	\$0.10	\$0.30	\$0.20	\$0.10
Ownership Costs	\$0.15	\$0.50	\$0.30	\$0.40	\$0.50
Total Cost Per Mile	\$0.65	\$0.60	\$0.60	\$0.60	\$0.60



TIME FOR MARK JACOBSON ON THE MYTHS & FACTS
OF CCS TECH & THE OTHER ENERGY TECH

**JULIET PLEASE SWITCH TO
MARK JACOBSON, STANFORD UNIVERSITY**



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Partnership**

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QUESTIONS?



THANK YOU

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