

How new USA climate laws will affect North American municipalities & citizens



QUICKLY CHANGING WORLD

Climate policy in North America is undergoing profound change as the USA has passed four new Federal Acts and invoked a fifth Act, representing unprecedented climate action.

They affect energy generation, batteries, low carbon homes and business buildings, electrified transportation and industry, clean energy manufacturing, and more.

What impact will these have on Canadian and US cities, urban planning, citizens, businesses, global economics, and government planning at different levels?

Thurs Oct 27 | 2:00 PM EASTERN / 11:00 AM PACIFIC



**Clean Air
Partnership**

CLIMATE SOLUTIONS WEBINAR SERIES



TODAY

◇ AMERICAN RESCUE PLAN ACT

A FEW MINUTES FOR CONTEXT

◇ AMERICAN INNOVATION
AND MANUFACTURING ACT

A FEW MINUTES

◇ DEFENCE PRODUCTION ACT

A FEW MINUTES

◇ INFRASTRUCTURE
INVESTMENT AND JOBS ACT

ABOUT 15 MINS

◇ THE INFLATION
REDUCTION ACT

ABOUT 25 MINS

Time allocations reflect climate relevance, impact,
and also some of these have been addressed in past webinars.



CAP CLIMATE SOLUTIONS WEBINAR SERIES

WITH HOST BRUCE (BF) NAGY



Past:
Clean energy technology & disinformation
with Professor Mark Jacobson, Stanford, May 11 2022



Future:
Methane emission mitigation by municipalities
With Prof Robert Howarth, Cornell
Tues Nov 8 2022, 7:00 PM Eastern



Future:
How has the war in the Ukraine affected climate policy
in Europe & UK? With Prof Peter Strachan, RGU Scotland
Tues Nov 22, 2:00 PM Eastern | 6:00 PM GMT (Scotland)

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NOW!**



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CLIMATE SOLUTIONS WEBINAR SERIES



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CLIMATE SOLUTIONS

- ◇ COLUMNIST, SPEAKER, CONSULTANT
- ◇ AUTHOR 250+ ARTICLES ON CLIMATE SOLUTIONS
- ◇ AUTHOR OF *THE CLEAN ENERGY AGE*, ROWMAN & LITTLEFIELD



PLEASE LOOK FOR MY FEATURE IN THE WINTER EDITION OF *CORPORATE KNIGHTS* MAGAZINE ON NORTH AMERICAN GREEN BUILDINGS AT SCALE.

SOLUTIONS, PRIORITIES, CASE EXAMPLES



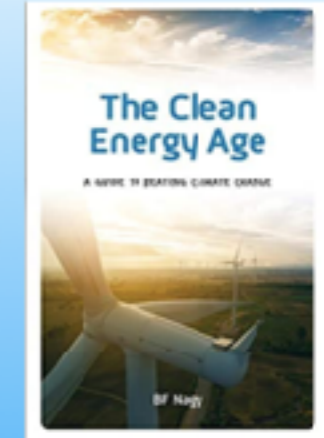
BUILDINGS
NEW & RETROFIT TECHNOLOGY & PROGRAMS



TRANSPORTATION
ELECTRIC FLEETS, INFRASTRUCTURE & TRANSIT VEHICLES



POWER & STORAGE
TECHNOLOGY, PLANNING & ECONOMICS



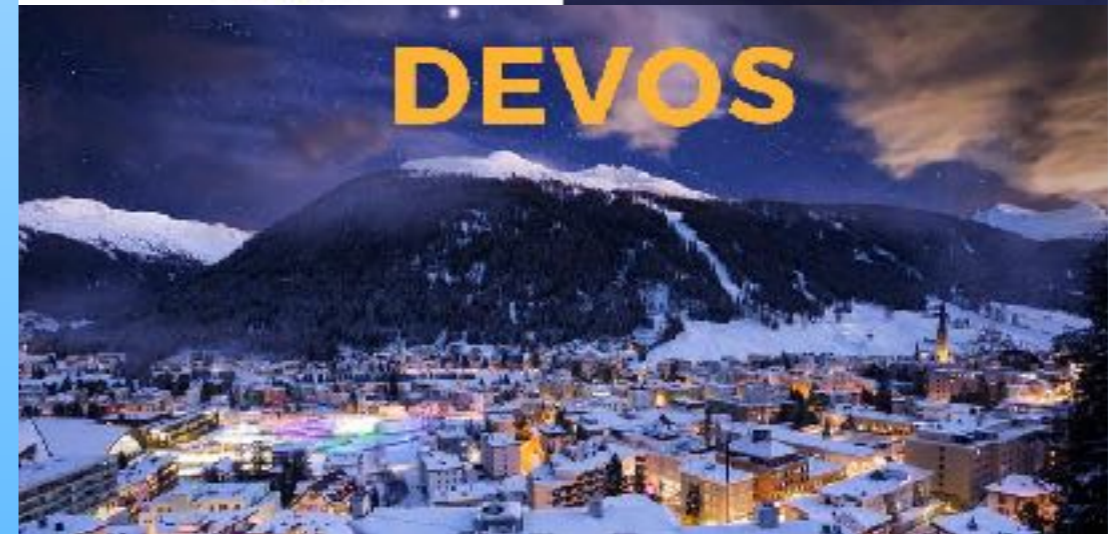
WHY DOES USA CLIMATE POLICY MATTER?

**DIRECTION FROM FEDERAL GOV'T OF
WORLD'S LARGEST ECONOMY INFLUENCES:**

- ◇ OTHER GOVERNMENTS
COUNTRIES, STATES, PROVINCES, CITIES
- ◇ CORPS & SMALLER BUSINESSES
- ◇ GLOBAL FINANCIAL SYSTEM
- ◇ INSTITUTIONS & ORGS - DOMESTIC & GLOBAL

**THESE ENTITIES ALSO INFLUENCE WASHINGTON DC
POLICY, THUS CREATING SYNERGIES WHEN ACTION
FINALLY BEGINS.**

**THESE ENTITIES CAN ALSO CHOOSE TO ACT
INDEPENDENTLY OF DIRECTION FROM WASHINGTON
DC, EG. CHINA/ASIA, EUROPE, CANADA, CALIFORNIA,
TEXAS, NY, MAJOR CITIES.**



INFLUENCE ON OTHER GOVTS, BUSINESS, MARKETS

- ◇ FEDERAL GOVERNMENT OFTEN SETS DIRECTION FOR SMALLER GOVERNMENTS, USA FOR SMALLER COUNTRIES
- ◇ SOMETIMES FAST IMPACT THROUGH REGULATION & FUNDING OF STIMULUS PROGRAMS OF SMALLER GOVERNMENTS
- ◇ SOMETIMES IMMEDIATE BUSINESS IMPACT THROUGH DIRECT TECHNOLOGY INCENTIVES FOR DEPLOYMENT, MANUFACTURE, RESEARCH, INDUSTRY DEVELOPMENT
- ◇ GLOBAL MARKET IMPACT THROUGH DOMESTIC & INTERNATIONAL TECHNOLOGY STANDARDS
- ◇ INFLUENCE ON LONGER TERM BUSINESS STRATEGY PLANNING & INVESTMENT
- ◇ INFLUENCE ON COUNTRIES WORLDWIDE MAKING STRATEGIC DECISIONS TO GROW OR PROTECT THEIR DOMESTIC ECONOMIES.



FOCUSSED PRELIMINARY ACTIONS



NEW LEGISLATION

AMERICAN RESCUE PLAN ACT MARCH 2021

COVID SUPPORT / ELECTRIC BUS INCENTIVES



NEW LEGISLATION

AMERICAN INNOVATION AND MANUFACTURING ACT DEC 2020

GLOBAL NATURAL REFRIGERANTS TREATY



INVOKED VIA PRESIDENT BIDEN'S EXECUTIVE ORDER

**DEFENCE PRODUCTION ACT (1950)
IN SUPPORT OF CLEAN ENERGY JUNE 2022**

SOLAR PANELS AND HEAT PUMPS, MARKET AND
MANUFACTURING INTERVENTION AND PROTECTIONISM

AMERICAN RESCUE PLAN ACT MARCH 2021



THE AMERICAN RESCUE PLAN ACT OF 2021 (ARP) APPROPRIATED FUNDS TO THE EPA TO ADDRESS DISPROPORTIONATE ENVIRONMENTAL OR PUBLIC HEALTH HARMS AND RISKS IN MINORITY POPULATIONS OR LOW-INCOME POPULATIONS.

ARP PROVIDED \$7 MILLION TOTAL PER ELIGIBLE SCHOOL WITH A \$300,000 REBATE FOR EACH EV BUS.

ELIGIBILITY

- ◇ PUBLIC SCHOOL DISTRICTS ON THE ELIGIBILITY LIST ARE ESTIMATED TO HAVE 30% OR MORE STUDENTS LIVING IN POVERTY
- ◇ STATES WITH ZERO SCHOOL DISTRICTS THAT MAKE THIS CUT OFF WILL HAVE ONE SCHOOL DISTRICT WITH THE HIGHEST PERCENT OF STUDENTS IN POVERTY REPRESENTED IN THE ELIGIBILITY LIST.
- ◇ TRIBAL SCHOOLS
- ◇ PRIVATE FLEETS THAT OPERATE SCHOOL BUSES UNDER A CONTRACT WITH AN ELIGIBLE ENTITY

DERA 2010, ARP 2021, IIJA 2021



ARP BUILT ON THE EXISTING DIESEL EMISSIONS REDUCTION ACT (DERA) OF 2010



THE AMERICAN RESCUE PLAN ACT (ARP)

ALLOCATED UP TO \$7 MILLION PER SCHOOL FOR ELECTRIC BUSES.

FIVE MONTHS LATER THE CLEAN SCHOOL BUS PROGRAM IN THE INFRASTRUCTURE INVESTMENT AND JOBS ACT (IIJA) ALLOCATED ANOTHER \$5 BILLION.

Eligibility Applicants	Targeted eligibility to underserved school districts, tribal schools, and private fleets serving those schools.	All public school districts and private fleets serving those schools
Replacement Fuel	Must be electric	Can be electric, diesel, gasoline, propane, or CNG buses meeting current emission standards
Bus Size	Old and new buses must be Type C or Type D school buses	Old and new buses must have Gross Vehicle Weight Rating (GVWR) greater than 10,000 lbs
Rebate Amount	\$300,000 per bus for up to 4 buses for a maximum rebate amount of \$1.2 million	\$20,000 - \$65,000 per bus depending on fuel type of the replacement bus for up to 10 buses with a maximum rebate amount of \$300,000

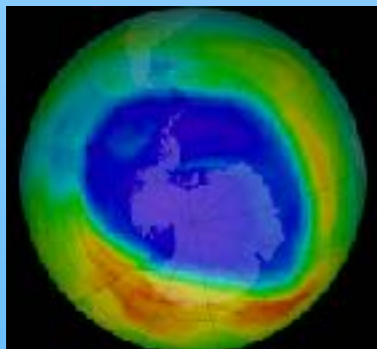
AMERICAN INNOVATION AND MANUFACTURING ACT (AIM ACT) DEC 2020

THE AIM ACT RATIFIES A GLOBAL NATURAL REFRIGERANTS TREATY AND CREATES INDUSTRIAL POLICY

THE PROBLEM:

REFRIGERANTS IN THE ATMOSPHERE HAVE TWO SERIOUS ENVIRONMENTAL IMPACTS:

- OZONE LAYER DEPLETION
- GLOBAL HEATING



ALTHOUGH REFRIGERANTS ARE SUPPOSED TO BE KEPT IN SEALED CONTAINMENT FOR REFRIGERATION, COOLING & ICE-MAKING, THE REALITY IS THAT LOSSES ARE:

- BUILDING SYSTEMS UP TO 30%
- REFRIGERATED TRUCKS UP TO 50%
- MARINE UP TO 39%

TREATY RATIFICATION & IMPLEMENTATION

MONTREAL PROTOCOL 1987

PHASE OUT HCFCs

RATIFIED BY 197 COUNTRIES

CANADA WAS A LEADER

OUR PHASE DOWN MODEL

STUDIED & COPIED

KIGALI AMENDMENT EFFECTIVE 2019

PHASE OUT HFCs

RATIFIED BY 111 COUNTRIES

CANADA 2018 - 85% PHASED OUT BY 2036

USA STALLED UNDER TRUMP

USA RATIFIED - AIM ACT 2020



OUR PARTIAL SUCCESS PHASING OUT HCFCs PROVES THE WORLD CAN WORK TOGETHER ON THE ENVIRONMENT.

OZONE DAMAGE BEGINNING TO BE REPAIRED.

US AIM RATIFICATION & GLOBAL ECONOMICS

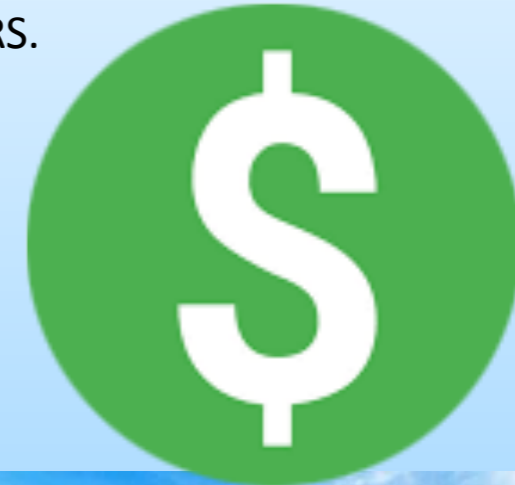
USA EQUIPMENT MANUFACTURERS WANTED RATIFICATION, LEVEL PLAYING FIELD, NATIONAL TECHNOLOGY STANDARDS - LOSING MARKET SHARE TO EURO & ASIAN COMPETITORS.

USA CHEMICAL COMPANIES WANTED DELAYS.

OTHER COUNTRIES & USA DISTRIBUTORS WANTED STANDARDS & GREATER CERTAINTY FOR MARKET STRATEGIES & SMOOTH SUPPLY CHAINS.

USA TRADE GROUPS & INSTALLERS WANTED TRAINING FINALIZED.

SOME STATE GOVERNMENTS STOPPED WAITING FOR NATIONAL RULES AND PASSED THEIR OWN LAWS, CREATING AN AWKWARD REGULATORY PATCHWORK.



DEFENCE PRODUCTION ACT

EXISTING LEGISLATION INVOKED VIA
PRESIDENT BIDEN'S EXECUTIVE ORDER

DEFENCE PRODUCTION ACT (1950) IN SUPPORT OF CLEAN ENERGY JUNE 2022

US DEPARTMENT OF ENERGY (DOE) AUTHORITY TO USE THE
DEFENCE PRODUCTION ACT TO ACCELERATE DOMESTIC
PRODUCTION OF KEY ENERGY TECHNOLOGIES.

SOLAR, TRANSFORMERS, OTHER GRID COMPONENTS,
HEAT PUMPS, INSULATION, ELECTROLYZERS, FUEL CELLS,
AND PLATINUM GROUP METALS.



WAS IT POLITICAL STRATEGY?

WAS IT A SIGNAL TO POLITICAL ACTORS, INCLUDING MODERATE DEMOCRAT MANCHIN, THAT LEGISLATIVE VOIDS
CAN LEAD TO PRESIDENTIAL ORDERS, WITH UNPREDICTABLE OUTCOMES FOR MANUFACTURERS?

EG. WHAT WOULD HAPPEN IF COAL COMPANIES WERE REQUIRED TO UNDERTAKE EMERGENCY RETOOLING TO
MANUFACTURE CLEAN ENERGY PRODUCTS? OR OIL COMPANIES TO DRILL GEOTHERMAL WELLS?

TWO MONTHS LATER MANCHIN DECIDED TO SUPPORT THE INFLATION REDUCTION ACT CLIMATE LEGISLATION.

DEFENCE PRODUCTION ACT



FACING BOTH AN ACTUAL WAR THAT IS PARTLY ABOUT ENERGY AND A GLOBAL 'WAR' ABOUT ENERGY TRANSFORMATION, BIDEN MAY HAVE BEEN SIGNALLING PREPARATIONS TO FIGHT ON BOTH FRONTS.

SENDING MESSAGES

WAS IT A SIGNAL TO RUSSIA THAT THERE ARE OTHER RESPONSES TO ENERGY SHORTAGES THAN SCRAMBLING FOR MORE OIL AND GAS?

DID IT SUGGEST THAT MORE AMERICAN GAS MIGHT BECOME AVAILABLE FOR EXPORT TO EUROPE?

WAS IT A SIGNAL TO THE OIL AND GAS INDUSTRY AND THOSE WHO SUPPORT THEM MOST, THAT ENERGY INDEPENDENCE MAY NOT MEAN ONLY MORE OIL AND GAS?

WAS IT A SIGNAL TO CHINA THAT THE USA WOULD COMMIT MORE TO DOMESTIC MANUFACTURING OF CLEAN ENERGY TECHNOLOGIES?

WAS IT A SIGNAL TO THE AMERICAN PUBLIC THAT THE DEMOCRATS WOULD CONTINUE THE THEME OF RE-SHORING MANUFACTURING AND STRENGTHENING AMERICAN-MADE PRODUCTS TO SUPPORT JOB GROWTH?

INFRASTRUCTURE INVESTMENT AND JOBS ACT



The Infrastructure Investment and Jobs Act

THE IIJA WAS PASSED IN NOV 2021,
A BIPARTISAN ACT OF THE US SENATE.
\$1.2 TRILLION OVER 8 YEARS, OF WHICH
\$550 BILLION IS NEW SPENDING.

FUNDING TO IMPROVE ROADS AND BRIDGES,
CREATE ELECTRIC VEHICLE CHARGING
NETWORKS, ELECTRIC BUS FLEETS, EXPAND AND
MODERNIZE POWER GRIDS AND SMART GRIDS,
SUPPORT ADVANCED BATTERIES AND ENERGY-
EFFICIENCY PROGRAMS, AND FUND
ENVIRONMENTAL REMEDIATION AND
RESILIENCE.

\$110 BILLION TOWARD ROADS, BRIDGES AND OTHER PHYSICAL
INFRASTRUCTURE (\$40B FOR BRIDGE REPAIR, \$17.5B FOR MAJOR PROJECTS).
\$73 BILLION FOR THE COUNTRY'S ELECTRIC GRID, SMART GRID AND POWER
STRUCTURES
\$66 BILLION FOR RAIL SERVICES
\$65 BILLION FOR BROADBAND
\$55 BILLION FOR WATER INFRASTRUCTURE
\$21 BILLION IN ENVIRONMENTAL REMEDIATION
\$47 BILLION FOR FLOODING AND CLIMATE RESILIENCY
\$39 BILLION TO MODERNIZE TRANSIT
\$25 BILLION FOR AIRPORTS
\$17 BILLION IN PORT INFRASTRUCTURE
\$11 BILLION IN TRANSPORTATION SAFETY PROGRAMS
\$7.5 BILLION FOR ELECTRIC VEHICLES AND EV CHARGING
\$5 BILLION IN LOW & ZERO-EMISSION BUSES
\$2.5 BILLION FOR FERRIES
\$27 BILLION FOR OBSOLETE AND UNPROVEN TECHNOLOGY INCLUDING
NUCLEAR, HYDROGEN AND CARBON CAPTURE (SATISFIES LARGE POLITICAL
DONORS).

ELECTRIC VEHICLES & CHARGING STATIONS



\$5 BILLION IN GRANTS TO SUPPORT STATE EXPANSION OF THE ELECTRIC VEHICLE CHARGING NETWORK AND \$2.5 BILLION IN DIRECT SUPPORT TO STATION OWNERS.

THE WHITE HOUSE SAYS ITS GOAL IS 500,000 CHARGERS. OBSERVERS SUGGEST THIS IS A GOOD FIRST STEP, BUT NOT ENOUGH MONEY.

THERE ARE ABOUT 60,000 GAS STATIONS IN THE USA, MEANING A CONTRIBUTION OF ABOUT \$125,000 EACH ON AVERAGE.



THIS MEASURE IS TO SOME EXTENT POLITICAL THEATRE, DESIGNED TO HELP THE PUBLIC OVERCOME FEAR OF CHANGE. EXPERTS SAY THE REALITY IS THAT 90% OF EV CHARGING IS DONE AT HOME, WHERE IT IS MORE CONVENIENT AND COSTS 1/3 BY COMPARISON. VEHICLE RANGE IS NOW ABOUT 300 MILES / 500 KILOMETRES.



ELECTRIC BUSES & ELECTRIC FERRIES



\$5 BILLION MORE FOR ELECTRIC BUSES AND ZERO CARBON BUSES.

\$2.5 BILLION FOR ELECTRIC FERRIES.
THERE ARE VERY FEW ELECTRIC FERRIES OPERATING SO FAR IN NORTH AMERICA.

IN CANADA, A COUPLE HAVE RECENTLY BEEN DELIVERED TO THE KINGSTON, ONTARIO AREA.



*ELECTRIC FERRIES FOR WOLFE ISLAND AND AMHEST ISLAND
NEAR KINGSTON, ONTARIO*



ELECTRIC BUSES FROM CANADA



- ◇ BYD IN ONTARIO
- ◇ LETENDA, QUEBEC
- ◇ LION ELECTRIC, QUEBEC
- ◇ NEW FLYER, WINNIPEG
- ◇ NOVA BUS, QUEBEC



BUY AMERICAN REQUIREMENTS

BUY AMERICAN REQUIREMENTS
GENERALLY DO NOT AFFECT CANADA
DUE TO RIGHTS PROVIDED UNDER
NAFTA AND WTO GPA.

HOWEVER WITH MOST LEGISLATIVE
PACKAGES CANADA'S FEDERAL
GOVERNMENT UNDERTAKES
ADDITIONAL LOBBYING AND
NEGOTIATION TO PROTECT
THE CANADIAN ECONOMY.

FOR EXAMPLE THE INFLATION REDUCTION ACT INCLUDES SPECIFIC ASSURANCES THAT ITS DEMANDING AMERICAN
CONTENT REQUIREMENTS FOR MANUFACTURING DO NOT THREATEN CANADA AND MEXICO AND OTHER
COUNTRIES WITH FREE TRADE AGREEMENTS WITH THE USA. EUROPE AND ASIA ARE NOT SO FORTUNATE.



The screenshot shows the Government of Canada website. At the top, there is a search bar and a language selector set to 'Français'. The main navigation bar includes a 'MENU' dropdown and social media icons for LinkedIn, YouTube, Twitter, Facebook, and MyTCS. The breadcrumb trail reads: 'Export guides and statistics > U.S. Government Procurement > Buy American Essentials'. Below this, there is a link to 'Canada-U.S. Agreement on Government Procurement'. A yellow warning banner is visible. The main heading is 'Canada-U.S. Agreement on Government Procurement'. Underneath, there is a 'Summary' section with a paragraph of text. To the right, there is a 'Other Key Information' sidebar with links to '1. Buy American Essentials', '1.1 Sector Specific Information', and '1.2 Exceptions and Waivers'.

BATTERIES & ELECTRICITY STORAGE



TO BOOST USA COMPETITIVENESS IN AN INDUSTRY TODAY DOMINATED BY ASIAN MANUFACTURERS, THE INFRASTRUCTURE BILL CONTAINS \$6 BILLION FOR DEPARTMENT OF ENERGY PROGRAMS:

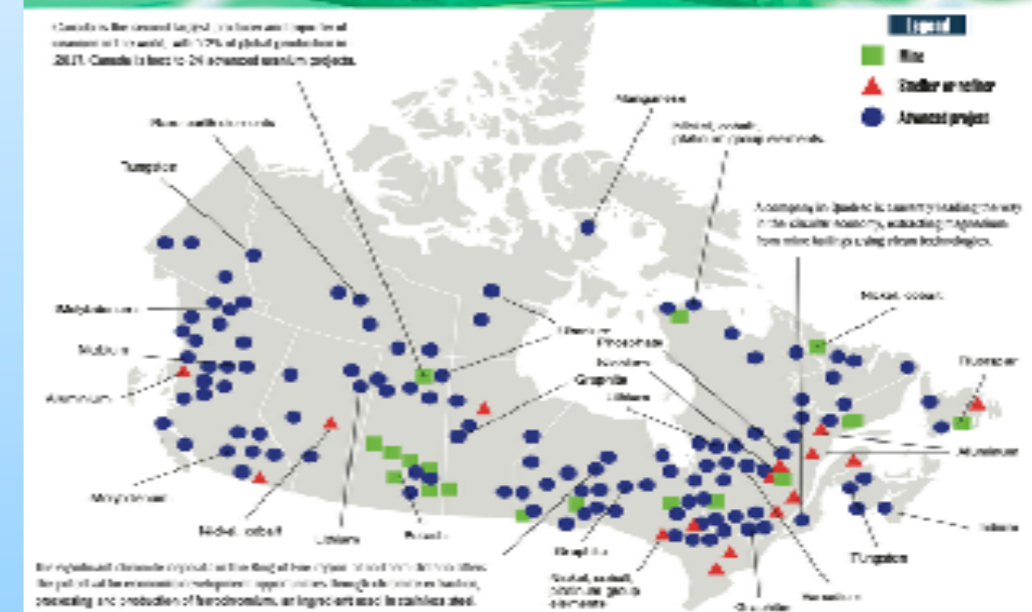
◇ \$3 BILLION FOR BATTERY MATERIALS PROCESSING

◇ \$3 BILLION FOR BATTERY MANUFACTURING AND RECYCLING.

◇ SETS UP A DOE PROGRAM TO STUDY THE POTENTIAL FOR “SECOND-LIFE” USES OF DEPLETED EV BATTERIES IN GRID ENERGY STORAGE.

◇ \$8 BILLION FOR A 30% MANUFACTURING TAX CREDIT FOR INVESTMENTS IN FACILITIES THAT MAKE OR RECYCLE ENERGY-RELATED PRODUCTS OR REDUCE THEIR GREENHOUSE GAS EMISSIONS.

◇ REFORM OF DOE LOAN PROGRAM OFFICE TO ALLOW \$17.7 BILLION ADVANCED TECHNOLOGY VEHICLE MANUFACTURING PROGRAM TO FUND HEAVIER VEHICLES, SHIPS AND TRAINS.



◇ \$140 MILLION FOR A DEMONSTRATION PROJECT FOR DOMESTIC PRODUCTION OF RARE EARTH MINERALS NEEDED FOR BATTERIES AND ELECTRIC DRIVETRAINS.

NOT JUST EXPORTING RESOURCES: CANADA IS ALSO WORKING WITH TESLA AND OTHERS TO ESTABLISH BATTERY & ELECTRIC VEHICLE MANUFACTURING FOR ELECTRIC VEHICLES. .

CANADA - EV MANUFACTURING



◇ Ford in Oakville



◇ General Motors came factory in Ingersoll



◇ Stellantis - Chrysler Windsor
plant EV1600 & batteries



◇ Honda in Alliston



◇ Batteries plant in Kingston



GRID & SMART GRID



GRID

- ◇ \$65 BILLION INVESTMENT INCLUDES THE LARGEST INVESTMENT IN CLEAN ENERGY TRANSMISSION AND GRID IN AMERICAN HISTORY.
- ◇ \$10 BILLION INCREASE IN BORROWING AUTHORITY FOR BONNEVILLE POWER ADMIN, PACIFIC NORTHWEST.
- ◇ \$2.5 BILLION REVOLVING LOAN FUND TO ALLOW THE DOE TO SERVE AS AN “ANCHOR TENANT” FOR UP TO HALF OF THE CAPACITY OF A NEW OR UPGRADED TRANSMISSION LINE -HELPS SECURE FINANCING.

SMART GRID

- ◇ \$3 BILLION TO DOE 2007 SMART GRID INVESTMENT GRANT PROGRAM.
- ◇ \$5 BILLION GRANTS FOR GRID OUTAGES CAUSED BY EXTREME WEATHER, WILDFIRES AND NATURAL DISASTERS.
- ◇ \$1 BILLION IN FUNDING IS EARMARKED FOR GRID INVESTMENTS IN RURAL OR REMOTE AREAS.
- ◇ \$500 MILLION TO SUPPORT STATE ENERGY PROGRAM



BIG BRAINS IN CANADA

GIVEN OUR SIZE AND GEOGRAPHY CANADIAN FIRMS HAVE LONG BEEN CONSIDERED LEADING EXPERTS IN TRANSPORTATION, COMMUNICATIONS AND POWER INFRASTRUCTURE, PLANNING, AND MORE RECENTLY, SOFTWARE DEVELOPMENT.

A NATURAL EXTENSION OF THIS HAS BEEN THE EMERGENCE OF NUMEROUS CANADIAN CONSULTING COMPANIES LICENSING SOFTWARE AND EXPORTING EXPERTISE IN POWER LOAD MANAGEMENT, SMART GRID, CYBER SECURITY AND A BROAD VARIETY OF NEW ELECTRICITY STORAGE ALTERNATIVES TO LITHIUM ION BATTERIES.

RESILIENCE



\$50 BILLION TO PROTECT AGAINST THE EFFECTS OF CLIMATE CHANGE - DROUGHTS, HEAT, FLOODS AND WILDFIRES, PLUS MAJOR INVESTMENTS IN WEATHERIZATION.

LAST YEAR ALONE, HUNDREDS WERE KILLED AS THE UNITED STATES FACED 22 EXTREME WEATHER AND CLIMATE-RELATED DISASTER EVENTS WITH LOSSES EXCEEDING \$1 BILLION EACH – A CUMULATIVE PRICE TAG OF NEARLY \$100 BILLION.

LEGISLATION TO MAKE COMMUNITIES SAFER AND INFRASTRUCTURE MORE RESILIENT TO THE IMPACTS OF CLIMATE CHANGE AND CYBER-ATTACKS.



LYTTON, BC



MAYFIELD, KENTUCKY



FT MYERS, FLORIDA



PARADISE, CALIFORNIA

DRINKING WATER



DELIVER CLEAN WATER TO ALL AMERICAN FAMILIES AND ELIMINATE THE NATION'S LEAD SERVICE LINES.

CURRENTLY, UP TO 10 MILLION AMERICAN HOUSEHOLDS AND 400,000 SCHOOLS AND CHILD CARE CENTERS LACK SAFE DRINKING WATER.

◇ \$55 BILLION TO EXPAND ACCESS TO CLEAN DRINKING WATER FOR HOUSEHOLDS, BUSINESSES, SCHOOLS, CHILD CARE CENTERS, TRIBAL NATIONS AND DISADVANTAGED COMMUNITIES.

◇ INVESTMENTS IN WATER INFRASTRUCTURE, ELIMINATION OF LEAD SERVICE PIPES.

URBAN TRANSIT



AMERICAN PUBLIC TRANSIT INFRASTRUCTURE IS INADEQUATE – WITH A MULTIBILLION-DOLLAR REPAIR BACKLOG, REPRESENTING MORE THAN 24,000 BUSES, 5,000 RAIL CARS, 200 STATIONS, AND THOUSANDS OF MILES OF TRACK, SIGNALS, AND POWER SYSTEMS IN NEED OF REPLACEMENT.

◇ \$39 BILLION OF NEW INVESTMENT TO MODERNIZE TRANSIT, IN ADDITION TO CONTINUING THE EXISTING TRANSIT PROGRAMS FOR FIVE YEARS AS PART OF SURFACE TRANSPORTATION REAUTHORIZATION.

◇ NEW INVESTMENTS AND IIJA REAUTHORIZATIONS PROVIDE \$89.9 BILLION IN GUARANTEED FUNDING FOR PUBLIC TRANSIT OVER THE NEXT FIVE YEARS.



REGIONAL TRAINS: THE IIJA ALSO ALLOCATES \$66 BILLION IN ADDITIONAL RAIL FUNDING TO ELIMINATE THE AMTRAK MAINTENANCE BACKLOG.

EXPAND BROADBAND



\$65 BILLION TO ENSURE EVERY AMERICAN HAS ACCESS TO RELIABLE HIGH-SPEED INTERNET.



BROADBAND INTERNET IS NECESSARY FOR AMERICANS TO DO THEIR JOBS, TO PARTICIPATE EQUALLY IN SCHOOL LEARNING, HEALTH CARE, AND TO STAY CONNECTED. YET, BY ONE DEFINITION, MORE THAN 30 MILLION AMERICANS LIVE IN AREAS WHERE THERE IS NO BROADBAND INFRASTRUCTURE WITH MINIMALLY ACCEPTABLE SPEEDS –



AMONG 35 COUNTRIES STUDIED, THE UNITED STATES HAS THE SECOND HIGHEST BROADBAND COSTS.



A MORE COMPLETE SUMMARY OF THE IIJA CAN BE DOWNLOADED [HERE](#). SEE [SCREEN 15](#) OF THIS PRESENTATION FOR ALLOCATION SUMMARY.

HOW IS THIS IMPORTANT FOR CITIES?

CANADIAN CITIES NEED TO TRACK TRENDS AND REFERENCE POINTS, CASE STUDIES, BEST PRACTICES IN THE PLANNING OF THEIR OWN STRATEGIES.

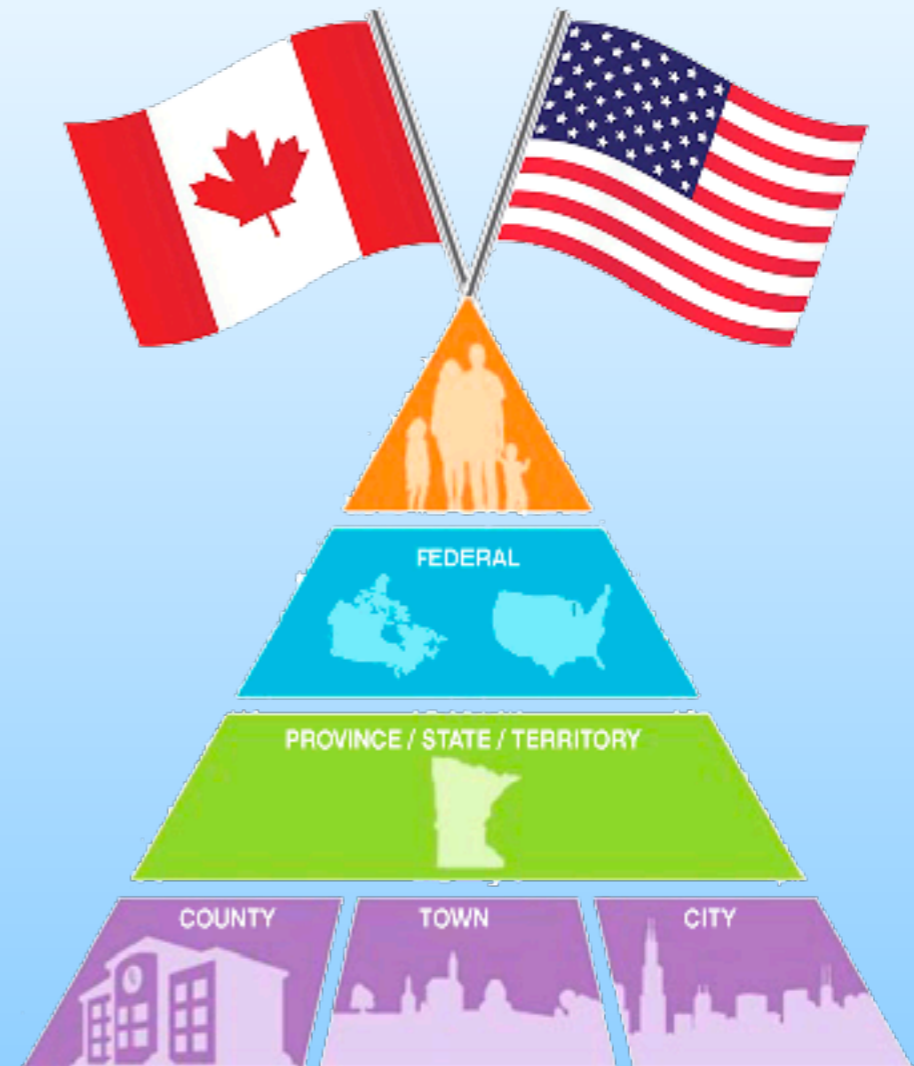
CANADIAN CITIES NEED TO FLAG DIRECT THREATS AND OPPORTUNITIES CREATED BY THESE ACTIONS.

US CITIES RECEIVE DIRECT LARGESSE AND IMPORTANT SIGNALS ABOUT THE FUTURE THROUGH THESE PACKAGES.

US STATES AND CITIES ARE IMPACTED BY RULES, NATIONAL STANDARDS IN SUCH PROGRAM-PACKED ACTIONS, AND SOMETIMES BY RESULTING INTERNATIONAL IMPACTS.



ECONOMIES IN CANADA, MEXICO AND OTHER COUNTRIES ARE AFFECTED POSITIVELY OR NEGATIVELY BY THESE POLICIES, IN SOME CASES, NOT BY ACCIDENT (EG. CHINA, RUSSIA).



CANADA: THE USA CLEAN ENERGY TRANSITION MODEL PROVIDES FOOD FOR THOUGHT AS CANADA'S FEDERAL GOVERNMENT AND ITS PROVINCIAL AND LOCAL GOVERNMENT PARTNERS CONTINUE TO WORK ON THEIR OWN PLANS.

SURPRISE BONUS

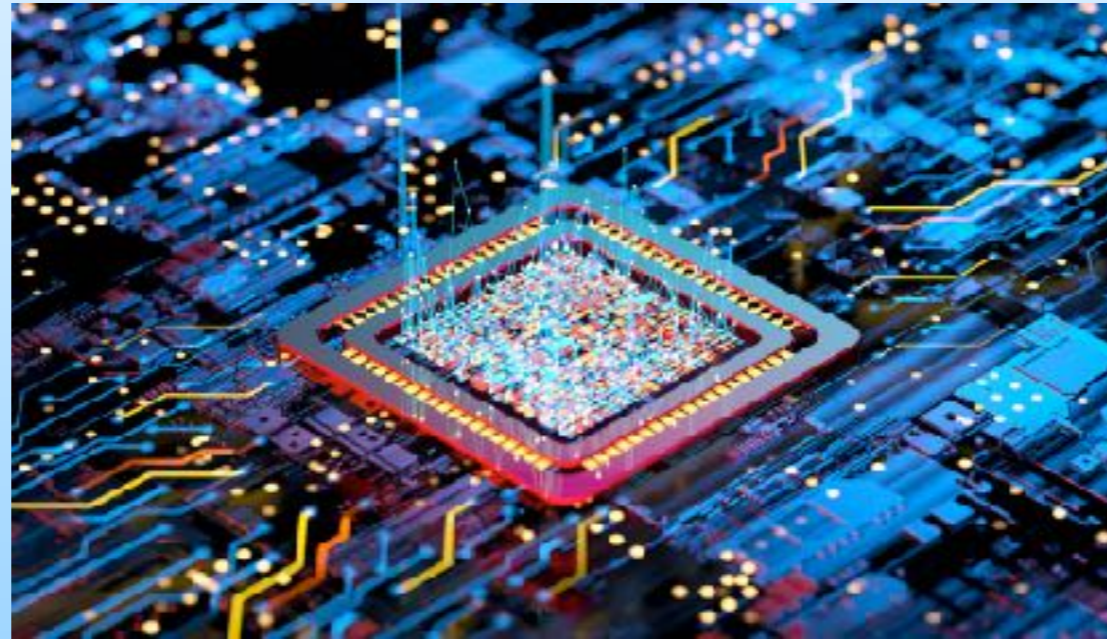
AN EXTRA FEW SCREENS ON YET ANOTHER NEW USA LEGISLATIVE PACKAGE



THE CHIPS AND SCIENCE ACT 2022 (AUG)

THE CHIPS & SCIENCE ACT

IN AN INCREASINGLY PROTECTIONIST ERA THE USA DESIGNS LEGISLATION SPECIFICALLY
TO RECLAIM SEMI-CONDUCTOR INDUSTRY DOMINANCE FROM CHINA



BIPARTISAN CHIPS AND SCIENCE ACT OF 2022, COMMITS \$280 BILLION TO STRENGTHEN AMERICAN MANUFACTURING CAPACITY, SUPPLY CHAINS, NATIONAL SECURITY, RESEARCH AND DEVELOPMENT, CREATE REGIONAL HIGH TECH HUBS AND DEVELOP A MORE INCLUSIVE STEM WORKFORCE.

SEMICONDUCTORS ARE KEY COMPONENTS IN HOUSEHOLD APPLIANCES, AUTOMOBILES, AND DEFENCE SYSTEMS.

AMERICA INVENTED THE SEMICONDUCTOR, BUT TODAY PRODUCES ABOUT 10% OF THE WORLD'S SUPPLY—AND NONE OF THE MOST ADVANCED CHIPS. IT RELIES ON EAST ASIA FOR 75% OF GLOBAL PRODUCTION.

THE NEW ACT INVESTS IN RESEARCH AND DEVELOPMENT, SCIENCE AND TECHNOLOGY, WORKFORCE DEVELOPMENT IN THE NANOTECHNOLOGY, CLEAN ENERGY, QUANTUM COMPUTING, AND ARTIFICIAL INTELLIGENCE SECTORS.

THE CHIPS & SCIENCE ACT

PROVIDES \$52.7 BILLION FOR AMERICAN SEMICONDUCTOR RESEARCH, DEVELOPMENT, MANUFACTURING, AND WORKFORCE DEVELOPMENT.

CREATES A 25% INVESTMENT TAX CREDIT FOR CAPITAL EXPENSES FOR MANUFACTURING OF SEMICONDUCTORS AND RELATED EQUIPMENT.

COULD STIMULATE HUNDREDS OF BILLIONS MORE IN PRIVATE INVESTMENT.

IMMEDIATE LAUNCH OF A SECTOR-SPECIFIC INTERAGENCY EXPERT WORKING GROUP ON PERMITTING AND PERMITTING-RELATED PROJECT DELIVERY ISSUES FOR HIGH-TECH MANUFACTURING.



ABOUT CHIPS AND SCIENCE ACT

- \$280B in funding
- \$52B for chipmakers to build manufacturing plants
- \$81B for The National Science Foundation
- \$24B in tax credits for chipmakers
- \$170B for tech research and development
- \$50B to The Energy Department over 5 years



REQUIRES RECIPIENTS TO DEMONSTRATE SIGNIFICANT WORKER AND COMMUNITY INVESTMENTS, OPPORTUNITIES FOR SMALL BUSINESSES, DISADVANTAGED COMMUNITIES.

RECIPIENTS CANNOT BUILD CERTAIN FACILITIES IN CHINA, OTHER COUNTRIES OF CONCERN, USE FUNDS FOR STOCK BUYBACKS, SHAREHOLDER DIVIDENDS. REQUIRES DAVIS-BACON PREVAILING WAGE RATES.

PASSAGE OF THE CHIPS AND SCIENCE ACT ACCOMPANIED BY COMPANIES ANNOUNCING ABOUT \$50 BILLION IN INVESTMENTS IN AMERICAN SEMICONDUCTOR MANUFACTURING.

THE CHIPS & SCIENCE ACT

ESTABLISHES A TECHNOLOGY, INNOVATION, AND PARTNERSHIPS DIRECTORATE AT THE NATIONAL SCIENCE FOUNDATION TO FOCUS ON FIELDS LIKE SEMICONDUCTORS AND ADVANCED COMPUTING, ADVANCED COMMUNICATIONS TECHNOLOGY, ADVANCED ENERGY TECHNOLOGIES, QUANTUM INFORMATION TECHNOLOGIES, AND BIOTECHNOLOGY.

STRENGTHENS COMMERCIALIZATION OF RESEARCH AND TECHNOLOGY, TO ENSURE THAT WHAT IS INVENTED IN AMERICA IS MADE IN AMERICA.

AUTHORIZES \$10 BILLION TO INVEST IN REGIONAL INNOVATION AND TECHNOLOGY HUBS ACROSS THE COUNTRY, BRINGING TOGETHER STATE AND LOCAL GOVERNMENTS, INSTITUTES OF HIGHER EDUCATION, LABOR UNIONS, BUSINESSES, AND COMMUNITY-BASED ORGANIZATIONS TO CREATE REGIONAL PARTNERSHIPS TO DEVELOP TECHNOLOGY, INNOVATION, AND MANUFACTURING SECTORS.



ALSO SUPPORTS USA INNOVATION IN WIRELESS SUPPLY CHAINS, ALLOCATING \$1.5 BILLION FOR PROMOTION AND DEPLOYMENT OF WIRELESS TECH

THAT EMPLOYS OPEN AND INTEROPERABLE RADIO ACCESS NETWORKS.



The Inflation Reduction Act 2022

A nighttime photograph of the United States Capitol building in Washington, D.C. The building is illuminated from within, with the dome and the portico columns glowing. The sky is dark blue, and some streetlights are visible in the foreground.

“THE INFLATION REDUCTION
ACT MAY NOT BE PERFECT,
BUT THERE HAS NOT BEEN A
MORE IMPORTANT PIECE OF
CLIMATE LEGISLATION PASSED
IN THE HISTORY OF THIS
PLANET.”

BF NAGY,

CLIMATE SOLUTION GROUP

THE INFLATION REDUCTION ACT

THE INFLATION REDUCTION ACT ENDS THE GLOBAL DEBATE ON WHETHER THE WORLD WILL PROCEED WITH THE TRANSITION FROM A FOSSIL FUELS BASED ECONOMY TO A CLEAN ENERGY BASED ECONOMY.



THE INFLATION REDUCTION ACT IS A CALL TO ACTION FOR THE CITIZENS, BUSINESSES, INSTITUTIONS AND GOVERNMENTS IN AMERICA, AND THOSE BEYOND ITS BORDERS.

IT REPRESENTS UNQUALIFIED COMMITMENT FROM THE WORLD'S DOMINANT POWER, WHICH NOW JOINS THE OTHER LEADING POWERS IN THE WORLD IN THE DETERMINATION TO BATTLE AND WIN AGAINST THE EXISTENTIAL THREAT OF CLIMATE CHANGE.

IT CATALYZES THE MOST SIGNIFICANT DISRUPTION IN HISTORY TO THE GLOBAL ECONOMY AND THE EXISTING GEOPOLITICAL WORLD ORDER.

SOME OF THE IRA DETAILS ARE BEING CRITICIZED, BUT ITS BROAD SCOPE SENDS AN UNEQUIVOCAL MESSAGE TO THE WORLD.

HISTORICALLY, WHEN AMERICA HAS RESPONDED WITH ONE DETERMINED EFFORT TO ANY CHALLENGE, IT HAS BEEN VICTORIOUS. WHEN WORLD POWERS HAVE ACTED ON A CHALLENGE SYNERGISTICALLY, THEY HAVE ALSO SUCCEEDED.

WHAT MAKES THE IRA SIGNIFICANT?

IT IS AN AGGRESSIVE SET OF DEMAND SIDE INTERVENTIONS THAT ARE PROVEN TO EFFECT CHANGE, INCLUDING:

- ◇ HOMEOWNER CASH REBATES AND TAX CREDITS FOR INCREASING EFFICIENCY AND DECARBONIZING HOMES
- ◇ HOMEOWNER TAX CREDITS FOR INSTALLATION OF SOLAR AND BATTERIES
- ◇ CLEAN ENERGY LOAN GUARANTEES TO UNDERWRITE BANK FINANCING OF CLEAN ENERGY INITIATIVES
- ◇ INCREASED EFFICIENT HOME CREDITS FOR HOUSING DEVELOPERS FOR NEW CONSTRUCTION AND DEEP RETROITS
- ◇ TAX CREDITS FOR NEW ELECTRIC VEHICLES, USED ELECTRIC VEHICLES, AND HOME CHARGERS.
- ◇ FUNDING FOR BUILDING CODE UPGRADES FOR ZERO-EMISSION BUILDINGS
- ◇ GRANTS FOR TRIBAL COMMUNITIES THAT TRANSITION TO CLEAN, ZERO-EMISSION, ELECTRIC ENERGY SYSTEMS



- ◇ FUNDING FOR DISADVANTAGED COMMUNITIES TO REDUCE GREENHOUSE GAS EMISSIONS, MITIGATE RISKS FROM EXTREME HEAT, IMPROVE CLIMATE RESILIENCY AND REDUCE INDOOR AIR POLLUTION
- ◇ BUSINESS BUILDING TAX CREDITS FOR ENERGY USE REDUCTIONS
- ◇ GRANTS AND LOANS FOR NEW OR RETROIT AFFORDABLE HOUSING PROJECTS THAT ADVANCE BUILDING ELECTRIFICATION, IMPROVE ENERGY AND WATER EFFICIENCY
- ◇ FINANCING FOR DOMESTIC MANUFACTURING OF HEAT PUMPS AND THE PROCESSING OF CRITICAL MINERALS
- ◇ TAX CREDITS TO ACCELERATE DOMESTIC MANUFACTURING OF SOLAR PANELS, WIND TURBINES, AND BATTERIES
- ◇ AN AGGRESSIVE NEW FEE FOR METHANE EMISSIONS

COMBINED WITH OTHER RECENT FEDERAL ACTIONS, THE IRA WILL KICKSTART BROAD GLOBAL CHANGE.

HOMEOWNER ELECTRIFICATION



DIRECT HOMEOWNER REBATES: UNTIL 2031, THE GOVERNMENT WILL PROVIDE \$4.28 BILLION IN REBATES UP TO A TOTAL OF \$14K PER HOUSEHOLD. DIRECT REBATES ARE FOR LOW- AND MODERATE-INCOME HOUSEHOLDS THAT INSTALL NEW ELECTRIC APPLIANCES.

LOW INCOME HOUSEHOLDS REBATES

FULL COST OF:

- ◇ UP TO \$8000 FOR HEAT PUMP FOR SPACE HEAT/COOLING**
- ◇ \$1750 FOR A HEAT PUMP WATER HEATER**
- ◇ \$840 FOR AN ELECTRIC/INDUCTION STOVE**
- ◇ \$840 FOR AN ELECTRIC CLOTHES DRYER**
- ◇ \$4000 FOR AN UPGRADED BREAKER BOX**
- ◇ \$2500 FOR UPGRADED ELECTRICAL WIRING**
- ◇ \$1600 FOR INSULATION, VENTILATION AND SEALING.**



MODERATE INCOME HOUSEHOLDS, CAN RECEIVE THE SAME REBATES COVERING 50% OF THE COSTS.

HIGHER INCOME HOMEOWNERS



THOSE WHO DO NOT QUALIFY FOR REBATES:

◇ HOUSEHOLDS CAN STILL ENJOY A TAX CREDIT OF 30% OF THE COSTS UP TO \$2000, FOR BUYING A HEAT PUMP FOR SPACE HEATING AND COOLING, OR A HEAT PUMP WATER HEATER.

◇ MORE RESTRICTIVE TAX CREDITS ALSO APPLY TO INDUCTION STOVES, NEW WINDOWS, DOORS, INSULATION AND UPGRADING ELECTRICITY BREAKER BOXES.

◇ THESE CAN INCLUDE BOTH EQUIPMENT AND INSTALLATION, BUT ARE LIMITED TO \$600 PER MEASURE, UP TO \$1200 PER HOUSEHOLD, PER YEAR.



TAX CREDITS: HOMEOWNERS WITH HOUSEHOLD INCOME EXCEEDING \$200K - \$300K MAY NOT QUALIFY FOR THESE REBATES
IE. INCOME = 150% OF AREA MEDIAN INCOME

- SEE [HTTPS://WWW1.NYC.GOV/SITE/HPD/SERVICES-AND-
INFORMATION/AREA-MEDIAN-INCOME.PAGE-](https://www1.nyc.gov/site/hpd/services-and-information/area-median-income.page)

RESIDENTIAL SOLAR & BATTERIES



SOLAR: THOSE WHO INSTALL RESIDENTIAL SOLAR PANELS OR SOLAR BATTERY SYSTEMS WITH AT LEAST 3 KILOWATT-HOURS OF CAPACITY WILL QUALIFY FOR A 30% TAX CREDIT, WITH NO CAP, FOR INSTALLATIONS FROM THE BEGINNING OF 2022 TO THE END OF 2032.



BATTERIES: BECAUSE IT COVERS BATTERIES, EVERYONE CAN MORE EASILY AFFORD A SYSTEM THAT STORES CHEAP NIGHTTIME POWER FOR USE WHEN COSTS ARE HIGH, OR CAN SHARE OR STORE SOME POWER FOR WEATHER EMERGENCIES AND OTHER OUTAGES.

DISADVANTAGED COMMUNITIES



ENVIRONMENT JUSTICE: FUNDING OF \$3 BILLION WILL ENABLE DISADVANTAGED COMMUNITIES TO REDUCE GREENHOUSE GAS EMISSIONS, MITIGATE RISKS FROM EXTREME HEAT, IMPROVE CLIMATE RESILIENCY AND REDUCE INDOOR AIR POLLUTION.

AFFORDABLE HOUSING: \$1 BILLION IN GRANTS AND LOANS FOR RETROFIT PROJECTS THAT ADVANCE BUILDING ELECTRIFICATION, IMPROVE ENERGY AND WATER EFFICIENCY IN AFFORDABLE HOUSING.

TRIBAL ELECTRIFICATION: \$145 MILLION TO HELP TRIBAL COMMUNITIES TRANSITION TO CLEAN, ZERO-EMISSION, ELECTRIC ENERGY SYSTEMS.



PURCHASES OF ELECTRIC VEHICLES



- ◇ \$7500 CREDIT FOR NEW ELECTRIC VEHICLES
- ◇ \$4000 FOR USED ELECTRIC VEHICLES
- ◇ \$1200 FOR HOME CHARGERS
- ◇ THIS WILL HELP MORE PEOPLE TO AFFORD AN EV AND SAVE MONEY EVERY MONTH.

- ◇ CREDITS DO NOT APPLY TO SEDANS OVER \$55K, SUVS/ TRUCKS OVER \$80K, AND ARE UNAVAILABLE IF THE BUYER'S INCOME EXCEEDS \$150K FOR SINGLE FILERS, \$300K FOR JOINT FILERS.
- ◇ CAR BUYERS WHO OWE VERY LITTLE IN TAXES CAN ASSIGN THE CREDIT TO THEIR DEALERSHIP, WHICH MIGHT PASS THE SUBSIDY BACK TO THE CUSTOMER. OR THEY MIGHT NOT.

COMMERCIAL BUILDINGS



COMMERCIAL: THE COMMERCIAL BUILDINGS ENERGY EFFICIENT CREDIT HAS BEEN SIGNIFICANTLY EXPANDED \$2.50 TO \$5.00 PER SQUARE FOOT FOR BUSINESSES ACHIEVING 25% -50% REDUCTIONS IN ENERGY USE OVER EXISTING BUILDING PERFORMANCE STANDARDS.



DEVELOPERS: THE NEW ENERGY EFFICIENT HOME CREDIT HAS BEEN BOOSTED TO \$5000 TO BUILD HOMES THAT QUALIFY FOR THE DEPARTMENT OF ENERGY'S ZERO ENERGY READY HOMES STANDARD. THIS APPLIES TO NEW SINGLE FAMILY, MULTIFAMILY AND MANUFACTURED HOMES, AS WELL AS EXISTING HOMES THAT UNDERGO A DEEP RETROFIT.

LOANS: A DOE LOAN PROGRAMS OFFICE PROVISION WILL PROVIDE \$3.6 BILLION TO GUARANTEE LOANS UP TO \$40 BILLION IN PRINCIPAL AMOUNTS.

BUILDING CODE: THE ACT ALSO PROVIDES \$1 BILLION TO SUPPORT CODE UPGRADES FOR ZERO-EMISSION BUILDINGS.

AMERICAN MADE SOLAR, WIND & BATTERIES



MANUFACTURING:

\$30 BILLION IS AVAILABLE AS A PRODUCTION TAX CREDIT TO ACCELERATE DOMESTIC MANUFACTURING OF SOLAR PANELS, WIND TURBINES, AND BATTERIES

\$10 BILLION HAS BEEN ALLOCATED AS AN INVESTMENT TAX CREDIT FOR BUILDING NEW FACILITIES THAT MANUFACTURE THESE TECHNOLOGIES.

\$500 MILLION IS NOW AVAILABLE TO SUPPORT DOMESTIC MANUFACTURING OF HEAT PUMPS AND THE PROCESSING OF CRITICAL MINERALS.

NON-RESIDENTIAL SOLAR & BATTERIES



TAX CREDIT RISES IN AN 'ENERGY COMMUNITY'

THE IRA PROVIDES AN ADDITIONAL 10% TAX CREDIT FOR SOLAR AND BATTERIES IN FORMER FOSSIL FUEL REGIONS CALLED "ENERGY COMMUNITIES." THE 10% ADDER INCREASES THE TAX CREDIT FROM 30% TO 40%, (TRANSFERABLE).



A solar installation on a capped landfill in New Jersey.

AN ENERGY COMMUNITY IS:

- ◇ A BROWNFIELD SITE.

- ◇ AN AREA WHICH HAS HAD SIGNIFICANT EMPLOYMENT RELATED TO THE EXTRACTION, PROCESSING, TRANSPORT, OR STORAGE OF COAL, OIL, OR NATURAL GAS.

- ◇ A CENSUS TRACT IN WHICH A COAL MINE HAS CLOSED, OR A COAL-FIRED ELECTRIC GENERATING UNIT HAS BEEN RETIRED.

MANY PARTIES SEEM TO BE EXERCISING CAUTIONS WITH THE DEFINITIONS, WAITING FOR THE TREASURY DEPARTMENT AND THE INTERNAL REVENUE SERVICE TO RELEASE OFFICIAL OPINIONS ABOUT WHAT QUALIFIES AS AN ENERGY COMMUNITY.

SOME CONSULTANTS HAVE BEEN PUBLISHING MAPS THAT MAY OR MAY NOT BE RELIABLE GUIDELINES FOR WHERE ENERGY COMMUNITIES ARE LOCATED. PLACES LIKE WEST VIRGINIA AND KENTUCKY COULD ENJOY MASSIVE OPPORTUNITIES FOR SOLAR DEVELOPERS TO CASH IN.

SOME OBSERVERS HAVE NOTED THAT WITH SOLAR AND BATTERIES NOW PRICED WELL BELOW EVERY ALTERNATIVE FORM OF ENERGY GENERATION, ALONG WITH THESE GENEROUS TAX CREDITS, PAYBACK CALCULATIONS ARE SHRINKING QUICKLY. IN ONE INSTANCE IT WAS SUGGESTED THAT PAYBACKS COULD BE UNDER 2 YEARS. IN OTHER WORDS THE COST OF A SOLAR AND BATTERY SYSTEM WITH A USEFUL LIFE OF SAY 25 YEARS, IS RETURNED TO YOU IN FULL IN 24 MONTHS. SO THE SAVINGS YOU EXPERIENCE FOR THE NEXT 23 YEARS ARE GRAVY.

MICRO-GRIDS



**JAIMIE HAMILTON,
TECHNICAL ADVISER AT CUMMINS:**

“WITH THE IRA...WE HAVE THE OPPORTUNITY TO BRING MICRO-GRIDS TO A MUCH WIDER MARKET...HAVING THE ABILITY FOR TAX EXEMPT ENTITIES TO MONETIZE TAX CREDITS IS GOING TO BE REALLY HELPFUL IN MAKING MICRO-GRIDS MORE EASILY ADOPTED.”

**JANA GERBER, NORTH AMERICAN MICRO-GRID
PRESIDENT FOR SCHNEIDER ELECTRIC:**

“THERE’S A LOT OF FUNDING IN THE IRA AROUND THE EVALUATION OF THE EFFECTS OF ELECTRIFICATION AND NON-TRANSMISSION ALTERNATIVES...THAT’S GOING TO SPUR MORE COLLABORATION BETWEEN UTILITIES AND MICRO-GRID PROVIDERS.”



**CHRIS ELLIS, EXEC VP DISTRIBUTED INFRASTRUCTURE FOR
POWERSECURE:**

“INCREASING THE AMOUNT OF ELECTRIC VEHICLES THROUGH ITS INCENTIVES, WHILE AT THE SAME TIME PROVIDING CREDIT AND INCENTIVES FOR RENEWABLE ENERGY SOURCES, THE IRA IS A WIN-WIN TO INCREASE THE DEMAND FOR MICRO-GRIDS.”

METHANE FEE - POLLUTERS PAY



THE IRA INCLUDES A VARIETY OF INCENTIVES, INCLUDING TAX CREDITS AND GRANTS, FOR USA INDUSTRIES TO REDUCE GREENHOUSE GAS EMISSIONS.

IT ALSO INCLUDES A SIGNIFICANT “DISINCENTIVE” FOR EMITTING METHANE FROM CERTAIN OIL AND GAS FACILITIES.

THE METHANE EMISSIONS REDUCTION PROGRAM, WHICH INCLUDES A METHANE WASTE EMISSIONS CHARGE THAT WILL BECOME EFFECTIVE JANUARY 1, 2024.



“AGGRESSIVELY CUTTING METHANE EMISSIONS IS THE FASTEST AND MOST EFFECTIVE WAY TO REDUCE THE RATE OF WARMING AND KEEP THE GLOBAL AVERAGE TEMPERATURE FROM BREACHING THE 1.5°C BARRIER ABOVE PREINDUSTRIAL LEVELS.”

METHANE FEE - POLLUTERS PAY



THE METHANE FEE WILL APPLY TO SPECIFIC PETROLEUM AND NATURAL GAS FACILITIES THAT CURRENTLY ARE REQUIRED TO REPORT METHANE AND OTHER GHG EMISSIONS TO THE EPA'S GREENHOUSE GAS REPORTING PROGRAM.

THOSE FACILITIES INCLUDE

- (1) OFFSHORE PETROLEUM AND NATURAL GAS PRODUCTION FACILITIES
- (2) ONSHORE PETROLEUM AND NATURAL GAS PRODUCTION FACILITIES
- (3) ONSHORE NATURAL GAS PROCESSING FACILITIES
- (4) ONSHORE NATURAL GAS TRANSMISSION COMPRESSION FACILITIES
- (5) UNDERGROUND NATURAL GAS STORAGE FACILITIES
- (6) LIQUEFIED NATURAL GAS STORAGE FACILITIES
- (7) (LIQUEFIED NATURAL GAS IMPORT AND EXPORT EQUIPMENT FACILITIES
- (8) (8) ONSHORE PETROLEUM AND NATURAL GAS GATHERING AND BOOSTING FACILITIES
- (9) (9) ONSHORE NATURAL GAS TRANSMISSION PIPELINES.



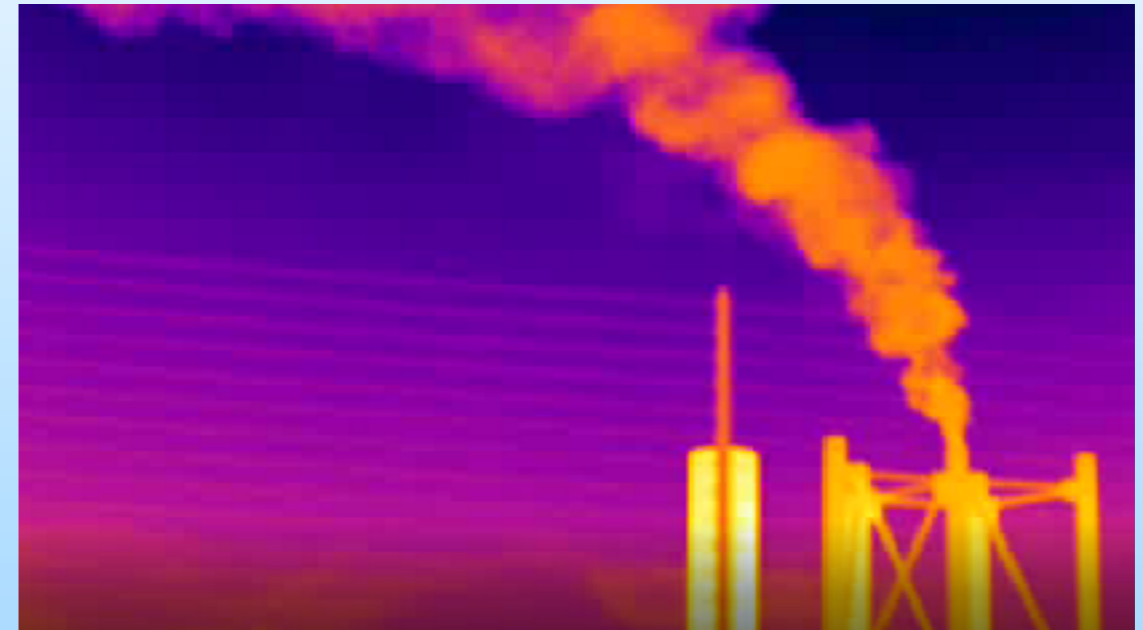
METHANE FEE - POLLUTERS PAY



THE METHANE FEE ESSENTIALLY IS A “CARBON TAX” THAT THE UNITED STATES IS APPLYING TO METHANE EMISSIONS.

THE LEGISLATION BUILDS ON PRIOR EPA METHANE NEW SOURCE PERFORMANCE STANDARDS AND PROPOSED REGULATIONS. CURRENT METHANE NSPS AIM TO CONTROL METHANE EMISSIONS FROM NEW OR UPDATED FACILITIES ASSOCIATED WITH PRODUCTION, PROCESSING, TRANSMISSION, AND STORAGE OF OIL AND NATURAL GAS.

THE FACILITY WILL BE CHARGED A FEE OF **\$900 PER METRIC TON** OF METHANE EMITTED ABOVE THAT THRESHOLD. THE FEE WILL INCREASE IN SUBSEQUENT YEARS, AND THE SAME TYPE OF CALCULATIONS WOULD APPLY TO NON-PRODUCTION FACILITIES (WHICH HAVE A THRESHOLD OF METHANE EMISSIONS EXCEEDING 0.05% OF THE NATURAL GAS SENT FOR SALE FROM THE FACILITY) AND NATURAL GAS TRANSMISSION FACILITIES (WHICH HAVE A THRESHOLD OF METHANE EMISSIONS EXCEEDING 0.11% OF THE NATURAL GAS SENT FOR SALE FROM THE FACILITY).



THE NEW FEES APPLY TO A FACILITY’S EMISSIONS IN EXCEEDANCE OF 25,000 METRIC TONS CARBON DIOXIDE EQUIVALENT (“CO₂E”). THE FEES FOR THESE EMISSIONS WILL BEGIN AT \$900 PER METRIC TON OF METHANE EMITTED IN 2024 AND WILL INCREASE TO \$1,200 IN 2025, AND \$1,500 IN 2026. TO CALCULATE METHANE WASTE EMISSIONS, FACILITIES WILL APPLY APPLICABLE EMISSIONS THRESHOLDS. FOR PETROLEUM AND NATURAL GAS PRODUCTION FACILITIES, THE THRESHOLD IS EMISSIONS EXCEEDING 0.2% OF THE NATURAL GAS SENT TO SALE FROM THE FACILITY. IF A PETROLEUM AND NATURAL GAS PRODUCTION FACILITY EMITS MORE THAN 0.2% OF THE AMOUNT OF NATURAL GAS THE FACILITY SENDS FOR SALE IN 2024.

METHANE FEE - POLLUTERS PAY



IT IS ESTIMATED THAT 2,172 FACILITIES WILL BE SUBJECT TO THE METHANE FEE.

THE IRA ALSO AUTHORIZES THE EPA TO APPROPRIATE \$850 MILLION IN GRANTS TO FACILITIES SUBJECT TO THE FEE TO MEET A RANGE OF OBJECTIVES, INCLUDING “IMPROVING AND DEPLOYING INDUSTRIAL EQUIPMENT AND PROCESSES” THAT REDUCE METHANE EMISSIONS, WHICH MAY REDUCE EMISSIONS FROM A FACILITY BELOW THE THRESHOLD.

IF EPA’S REGULATIONS AND THE APPLICABLE STATE IMPLEMENTATION PLANS ARE NOT IN EFFECT BY JANUARY 1, 2024, THE SOURCE CATEGORY FACILITIES IN THOSE STATES WILL BE SUBJECT TO THE METHANE FEE.



THE METHANE FEE ULTIMATELY MAY BE WAIVED FOR A FACILITY IF (1) EPA ADOPTS ITS PROPOSED RULE FOR STANDARDS OF PERFORMANCE FOR NEW, RECONSTRUCTED, AND MODIFIED SOURCES AND EMISSIONS GUIDELINES FOR EXISTING SOURCES: OIL AND NATURAL GAS SECTOR CLIMATE REVIEW, 86 FED. REG. 63110 (NOV. 15, 2021), OR OTHER REGULATIONS THAT WILL RESULT IN EQUIVALENT OR GREATER EMISSIONS REDUCTIONS, AND (2) SUCH REGULATIONS ARE THEN ADOPTED IN THE IMPLEMENTATION PLANS OF THE STATES WHERE THOSE FACILITIES SIT.

QUESTIONS?



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