

# Addressing Climate Change – Fundamental Principles

*Eliminating sources of greenhouse gas pollution & removing carbon dioxide from the atmosphere*

assembled by Peter Sircom Bromley | pbsky@telus.net | 604-733-2760

The global economy has all the human and technical resources necessary to prevent dangerous climate change. Those resources are being deployed now, to varying degrees, worldwide: renewable energy for the grid, electrification of transportation, land use reform, and direct air capture of carbon dioxide. Taken together, they amount to a *pollution response and cleanup effort* directed at **stopping greenhouse gas pollution and removing CO<sub>2</sub> pollution from the atmosphere**. Coordinating and maximizing these efforts is the fundamental objective of all climate policy and action.

## Action pathways

To halt and reverse climate change, emission intensive sectors of the world economy will **eliminate** and **clean up** greenhouse gas (GHG) pollution by:

### Replacing energy conversion devices (ECDs) that burn fossil fuels

- **Electricity generation:** phase out thousands of coal-, gas- and oil-fired electricity generators and replace with renewable energy plants, or safe 4th generation nuclear reactors.
- **Cement and steel production:** phase in electricity-based production processes.
- **Transportation/industrial:** replace a billion+ internal combustion engines used for propulsion and power tools with electric motors.
- **Buildings:** use electricity, geo exchange and biofuels for processes and systems requiring heat.

### Replacing fossil fuels with synthetic fuels

- **Transportation:** develop and expand synthetic fuel and biofuel production for aeronautical and automotive sectors (near term).

### Adopting land use practices that preserve and restore the biosphere

Maintain and restore biosphere function by:

- **Land preservation:** restoring natural habitat
- **Agricultural reform:** reducing tillage, reducing usage of nitrogen fertilizer, reforming rice cultivation, reducing cattle farming
- **Improving organic waste management** to reduce CH<sub>4</sub> pollution
- **Human population management.**

## Controlling fluorine-based chemicals

Restrict or ban:

- hydrofluorocarbons (HFCs) used in refrigeration,
- perfluorocarbons (PFCs) used in the manufacture of semiconductors, in aluminum production and as specialized refrigerants and solvents,
- sulphur hexafluoride (SF<sub>6</sub>) used in semi-conductor manufacturing, and
- nitrogen trifluoride (NF<sub>3</sub>) used as an electronics etching agent.

## Removing excess atmospheric CO<sub>2</sub>

- accelerate development and roll out of direct air capture (DAC) technologies,
- sequester, stockpile, and use captured CO<sub>2</sub>, and
- restore CO<sub>2</sub>-absorbing soils and native vegetation on abandoned, unused and cleared land.

## Toward universal policy objectives

Framing climate action as, fundamentally, a *pollution response and cleanup effort* has a grounding effect on policy. It cuts through ideology, makes climate action easy to understand, and gives common purpose to the wide and diverse range of practical climate mitigation measures already underway worldwide: energy transition, sustainable land management, and carbon dioxide removal.

National or sub-national policies and actions guided by these measures would differ according to circumstances. However, the fundamental principles and objectives would be identical, forming the basis of effective, non-partisan policy instruments that would survive election cycles.

To ensure long-term success of climate policies and actions, governments would:

- promote full public awareness of, and engagement with, the fundamental principles that guide action to eliminate and clean up GHG pollution, and
- illuminate the process of intervention and transition with respect to a zero carbon economy, especially in the energy sector where fossil fuel-based technologies are being rapidly phased out while zero carbon equivalents are phased in.