

# Kigali Agreement: Simplified

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Paris Agreement to mitigate climate change was followed by another major global agreement – Kigali Agreement. In this post, we explain the importance of Kigali agreement and its relevance to India.

## What is Kigali Agreement?

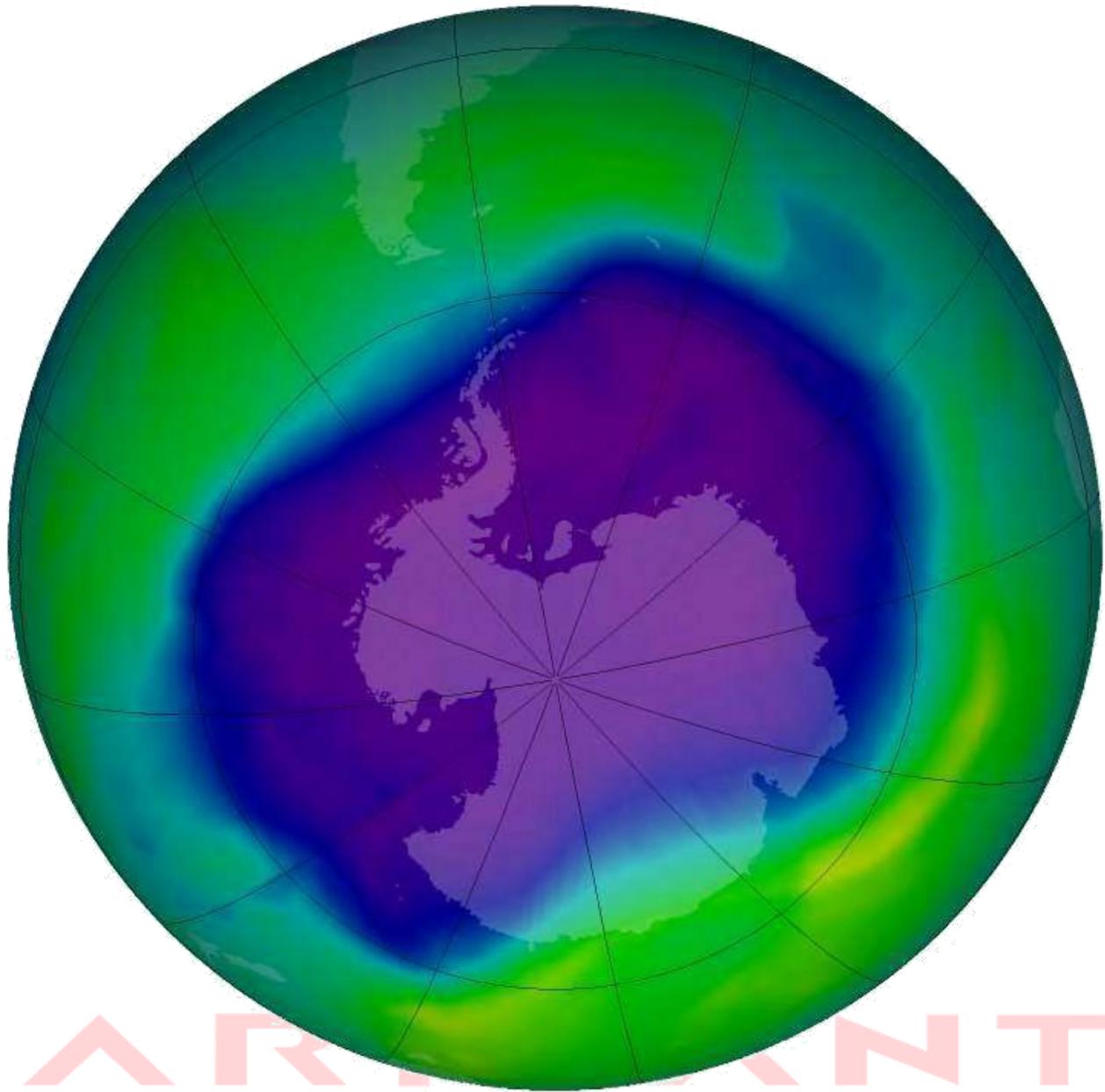
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- In the 28<sup>th</sup> meeting of the Parties to the Montreal Protocol, negotiators from 197 nations have signed a historic agreement to amend the Montreal Protocol in Kigali, a capital city of a tiny African country, Rwanda on 15<sup>th</sup> October 2016.
- As per the agreement, these countries are expected to reduce the manufacture and use of **Hydrofluorocarbons (HFCs)** by roughly 80-85% from their respective baselines, till 2045.
- This phase down is expected to arrest the global average temperature rise up to 0.5<sup>o</sup> C by 2100.
- Kigali agreement is an amendment to Montreal Protocol.

## What is Montreal Protocol?

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- The Montreal Protocol is a most effective international environmental treaty to phase out the Ozone Depleting Substances (ODSs) from the atmosphere. It came into force in 1989.
- It has 197 member parties to the protocol and become a first international treaty with complete ratification.
- It has undergone several amendments and Kigali amendment is the eighth amendment to this protocol.
- It has successfully curbed the 98% production of **chlorofluorocarbons** and other ODSs and significantly contributed to the repair of the ozone hole.

## What are Hydrofluorocarbons (HFCs)?

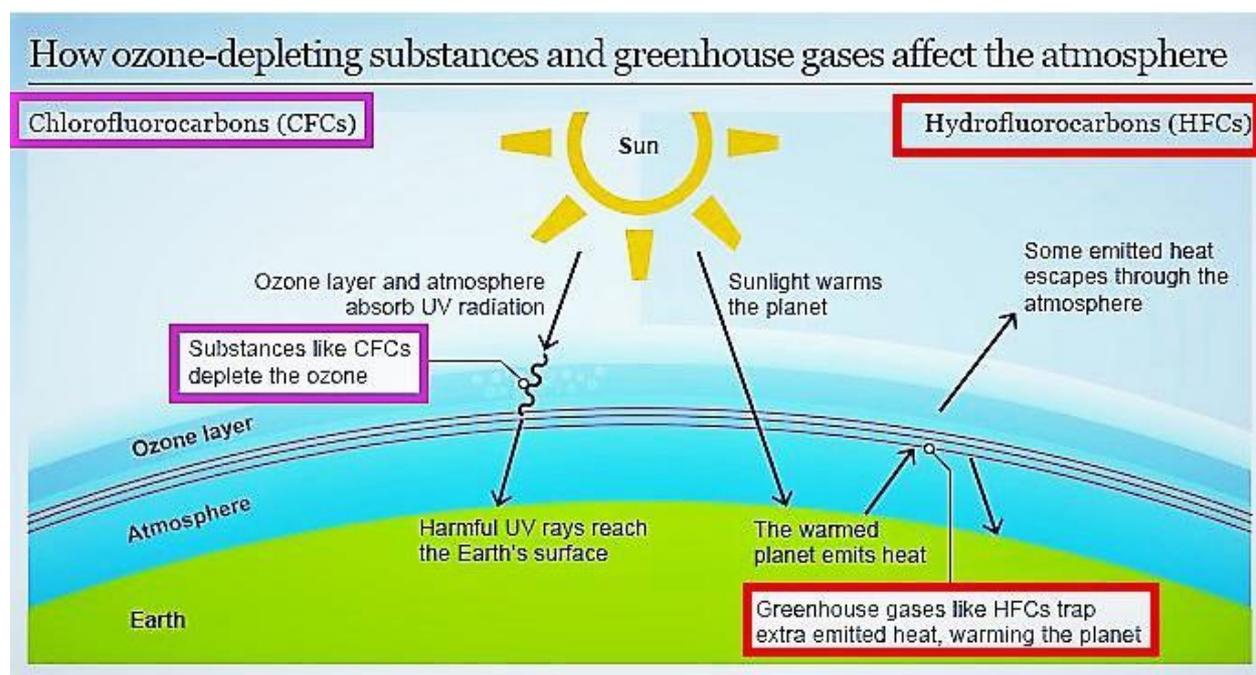
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# Fluoro Carbons

Code	Name	Examples
CFC	Chlorofluorocarbon	CFC-114a ( $\text{CF}_3\text{CFCl}_2$ ) CFC-12 ( $\text{CF}_2\text{Cl}_2$ )
HCFC	Hydrochlorofluorocarbon	HCFC-123 ( $\text{CF}_3\text{CHCl}_2$ ) HCFC-22 ( $\text{CHF}_2\text{Cl}$ )
HFC	Hydrofluorocarbon	HFC-23 ( $\text{CHF}_3$ ) HFC-134a ( $\text{CF}_3\text{C}_2\text{HF}$ )

- Hydrofluorocarbons are organic compounds containing hydrogen, Carbon, and fluorine.
- They are commonly used as **substitutes for** Ozone depleting substances like Chlorofluorocarbons (CFCs) and are used in refrigerators and air-conditioners.

HFCs: Will not cause ozone layer depletion, but will cause global warming!



Though HFCs are not as harmful as CFCs for ozone layer depletion, they have a thousand times more potential to cause global warming effect than commonly known greenhouse gases like carbon Dioxide, methane etc.



## Kigali Agreement: Important Points

- it is a **legally binding agreement** between the signatory parties with non-compliance measures.
  - It will come into effect from 1st January 2019 provided it is ratified by at least 20 member parties by then.
  - It has shown a considerable flexibility in approach while setting phase-down targets for different economies accommodating their developmental aspirations, different socio-economic compulsions, and scientific & technological capabilities. It
  - has divided the signatory parties into three groups-
1. **The first group** consists of rich and developed economies like USA, UK and EU countries who will start to phase down HFCs by 2019 and reduce it to 15% of 2012 levels by 2036.
  2. **The second group** consists of emerging economies like China, Brazil as well as some African countries who will start phase down by 2024 and reduce it to 20% of 2021 levels by 2045.
  3. **The third group** consists of developing economies and some of the hottest climatic countries like India, Pakistan, Iran, Saudi Arabia who will start phasing down HFCs by 2028 and reduce it to 15% of 2024-2026 levels till 2047.
- It also has a provision for a **multilateral fund** for developing countries for adaptation and mitigation.
  - The Technology and Energy Assessment Panel (TEAP) will take a periodic review of the alternative technologies and products for their energy efficiency and safety standards.

## Why is Kigali Agreement significant?

- It strengthens the Paris Agreement which sets an ambitious target of restricting the rise in global temperature below 2<sup>0</sup> Celsius, as compared to pre-industrial level.
- Unlike Paris agreement, it gives clear, concrete and mandatory targets with **fixed timelines** to the signatory parties to achieve their targets.
- It would prevent the emission of HFCs equivalent to 70 billion tons of CO<sub>2</sub>.

[Also read: National Commission on Farmers - Recommendations](#)

## Kigali Amendment and India

- India played a very flexible and cooperative role in the whole negotiating process.
- It has agreed on a lenient schedule as it consumes only 3% of HFCs as compared to the other nations like the USA (37%) and China (25%).

It would be tough for Indian to adhere to this agreement along with Paris Pact especially when it has embarked on an ambitious "Make in India" Programme to increase its industrial production.

- It should also take into consideration the hot climatic conditions and growing demand for air conditioners, refrigerators, and cars with growing middle-class incomes while implementing the program.
- Still, as a responsible nation with a global perspective, the Indian government has

voluntarily passed the order to stop the production of HFC-23 which is a byproduct of commonly used refrigerant. This will reduce the emission by 100 million tons equivalent of Carbon dioxide in next 15 years.

## Implications of Kigali Agreement on India

Indian industries using HFCs like Air-Conditioning industry, Automobiles, and refrigeration industry have some serious implications on financial and technical fronts:

1. **Financial implications** – Industries have to either invest in R & D to find out the substitutes for HFCs or they have to buy patented substances and technologies from other MNCs. Consequently, the cost of production will increase which may ultimately shrink the buyer base for their products.
2. **Technological implications** – Some of the developed nations have already started using substitutes of HFCs in their products and have a sound technological knowledge about their use. Without technology transfer or research, it would be difficult for domestic industries to compete with them in global as well as domestic market.

Also read: Major Programs Under Central Plan: Budget 2015-16

On a positive side, this will incentivise business and scientific fraternity to invest their financial and intellectual resources in finding out more economic and environment-friendly technological alternatives.

## What next, after HFCs?



The answer is HFO refrigerants. HFO stands for hydrofluoro olefin. HFC refrigerants are composed of hydrogen, fluorine and carbon atoms connected by single bonds between the atoms. HFO refrigerants are composed of hydrogen, fluorine and carbon atoms, but contain at least one double bond between the carbon atoms.

HFO-1234yf has physical properties similar to HFC-134a. Therefore, HFO-1234yf has the potential to be used in current HFC-134a systems with minimal system modifications.

## What are the main characteristics of HFO-1234yf?

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- Low toxicity.
- Low GWP; GWP = 4.
- Zero ozone depletion potential.
- Low total contribution to climate change.
- Same operating pressures as the current HFC-134a system.

## References

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