



Federal Ministry  
for the Environment, Nature Conservation,  
Building and Nuclear Safety

of the Federal Republic of Germany



# **Integrating the HFC phase down in ongoing national mitigation actions**

## **Green Cooling Africa Initiative (GCAI)**

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**Side Event MOP28  
Kigali, 10<sup>th</sup> of October 2016**

## Green Cooling Africa Initiative (GCAI)

- **Countries:** Mauritius, Namibia (CTCN funded)  
Ghana, Kenya (BMUB funded)
- **Timeframe:** 2016-2017
- **Objective:** To enable participating countries to have the necessary information (i.e. inventory) and tools (i.e. policy and technology options), to create a shift in the cooling sector to more sustainable technology options

## Climate Technology Center & Network (CTCN)

CTCN aim to address barriers that hinder the development and transfer of climate technologies and to thereby help create an enabling environment

**Technical  
assistance**

**Network &  
Collaboration**

**Access to  
information &  
Knowledge  
Management**

## Outputs of the Green Cooling Africa Initiative

**Output 1**

**Robust GHG inventory for the cooling sector established**

**Output 2**

**Analysis of the technological gap between BAU and internationally available best technological options**

**Output 3**

**Policy and regulatory framework recommendations**

**Output 4**

**National and regional technology roadmap recommendations**



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**Output 1**

**Robust GHG inventory for the cooling sector established**



## Develop current and future RAC stock and sales for Namibia

GCI top down data on unit sales and stock data

Sales (Units Sold p.a.)		2015	2020	2030	CAGR	
					2020	2030
Chiller	Air conditioning chillers	55	61	75	2.1%	2.1%
MAC	Car air conditioning	20,212	36,008	118,790	12.2%	12.5%
MAC	Large vehicle air conditioning	222	250	312	2.4%	2.3%
Unitary Air Conditioning	Commercial ducted splits	756	1,069	1,875	7.2%	6.2%
Unitary Air Conditioning	Multi-splits	534	633	1,086	3.5%	4.8%
Unitary Air Conditioning	Self-contained air conditioners	1,699	2,016	3,456	3.5%	4.8%
Unitary Air Conditioning	Split residential air conditioners	5,724	14,749	104,480	20.8%	21.4%
Commercial Refrigeration	Centralised systems for supermarkets	4	5	6	4.6%	2.7%
Commercial Refrigeration	Condensing units	5	5	6	0.0%	1.2%
Commercial Refrigeration	Stand-alone equipment	677	756	928	2.2%	2.1%
Domestic Refrigeration	Domestic refrigeration	18,088	38,491	140,394	16.3%	14.6%
Industrial Refrigeration	Centralised systems	33	37	45	2.3%	2.1%
Transport Refrigeration	Refrigerated trucks/trailers	1,650	1,848	2,290	2.5%	2.4%

Stock (Units in use)		2015	2020	2030	CAGR	
					2020	2030
Chiller	Air conditioning chillers	710	811	1,041	2.7%	1.7%
MAC	Car air conditioning	137,168	224,450	709,465	10.4%	8.0%
MAC	Large vehicle air conditioning	1,775	2,028	2,601	2.7%	1.7%
Unitary Air Conditioning	Commercial ducted splits	4,123	7,067	15,107	11.4%	5.2%
Unitary Air Conditioning	Multi-splits	5,079	6,198	10,117	4.1%	3.3%
Unitary Air Conditioning	Self-contained air conditioners	16,171	19,731	32,209	4.1%	3.3%
Unitary Air Conditioning	Split residential air conditioners	41,430	82,657	443,968	14.8%	11.9%
Commercial Refrigeration	Centralised systems for supermarkets	75	86	110	2.7%	1.7%
Commercial Refrigeration	Condensing units	62	71	91	2.7%	1.7%
Commercial Refrigeration	Stand-alone equipment	8,875	10,141	13,006	2.7%	1.7%
Domestic Refrigeration	Domestic refrigeration	182,615	287,457	841,460	9.5%	7.4%
Industrial Refrigeration	Centralised systems	355	406	520	2.7%	1.7%
Transport Refrigeration	Refrigerated trucks/trailers	17,832	20,376	26,134	2.7%	1.7%



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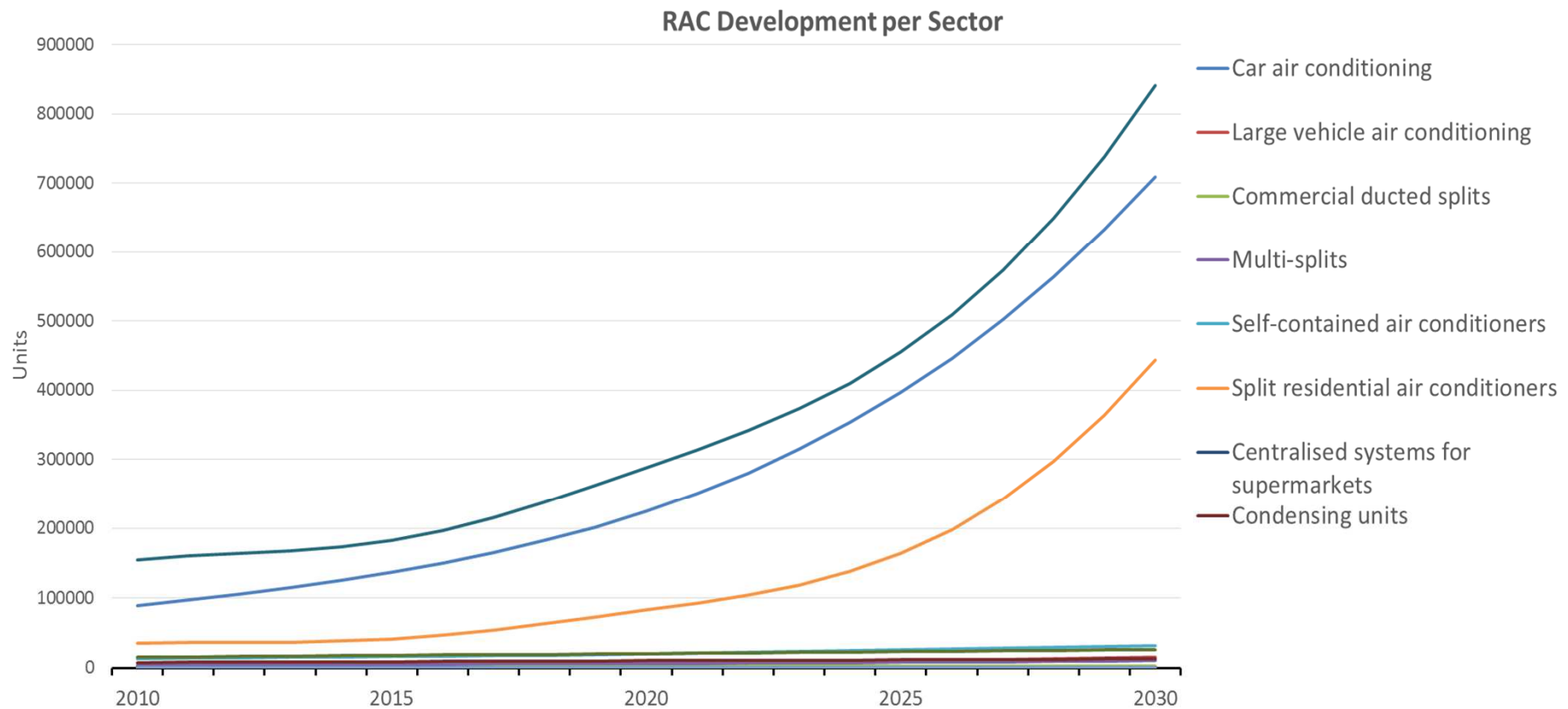


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## Development of RAC units per sub sector for Namibia 2030





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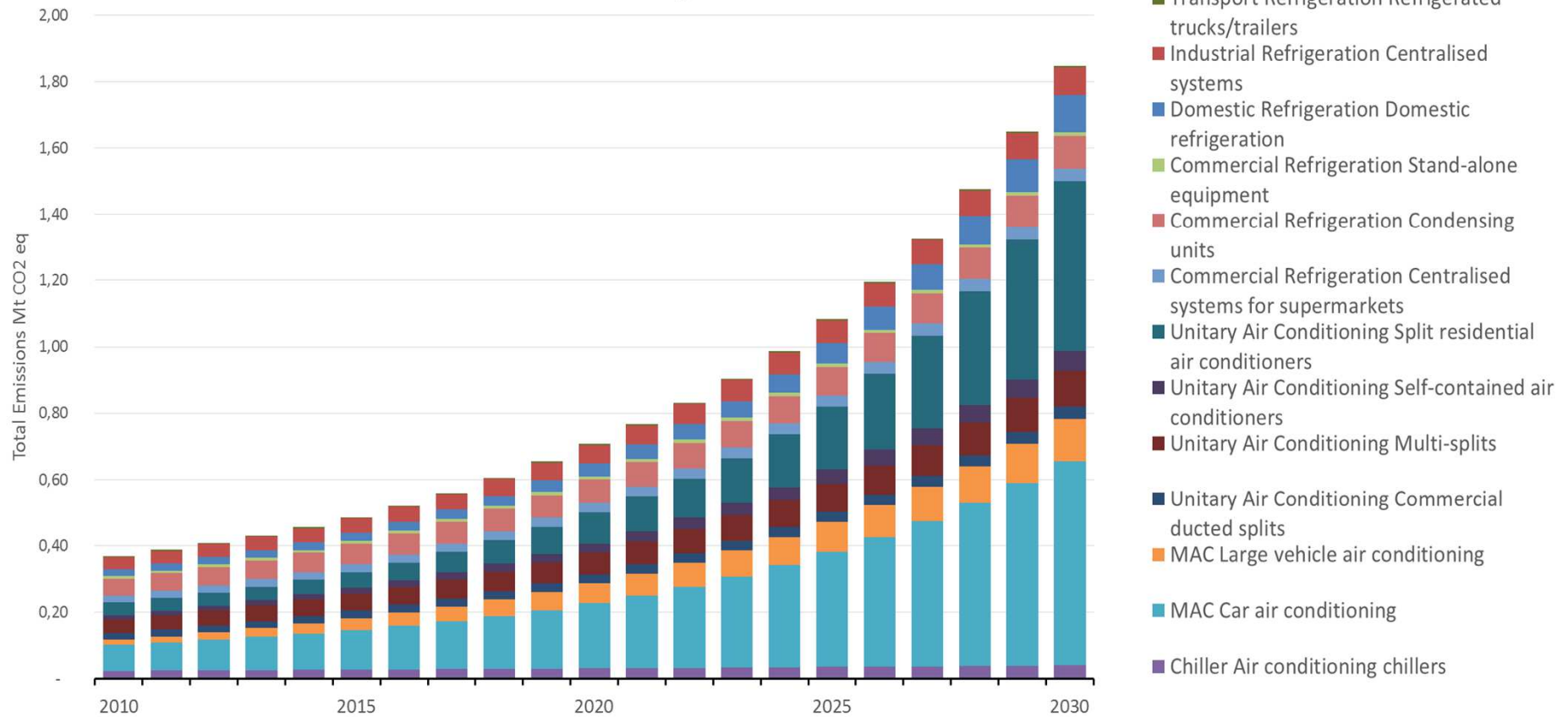
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# Development of GHG emissions per RAC sub sector for Namibia (business as usual)

Greenhouse gas emissions from the RAC sector





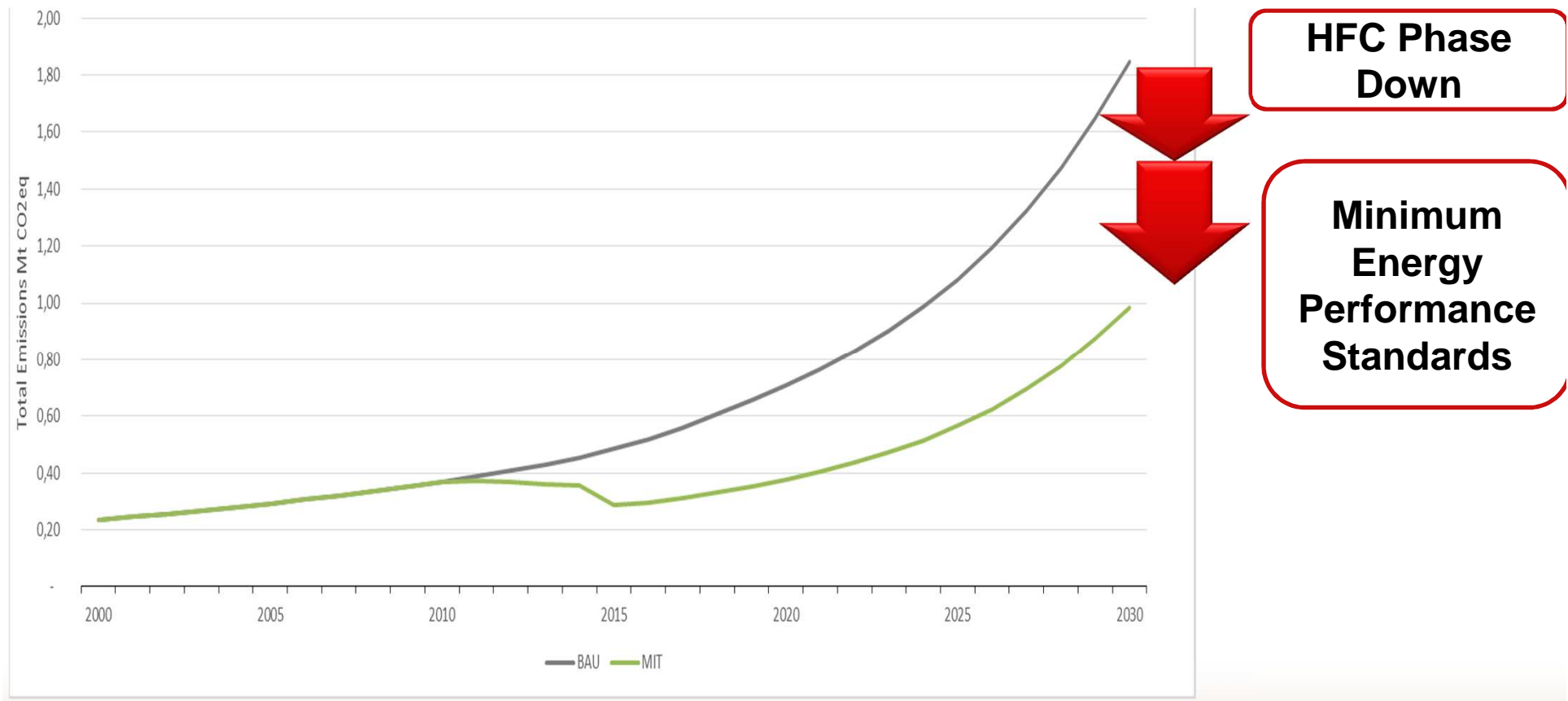


## Output 2

- **Analysis of the technological gap between business as usual (BAU) and internationally available best technological options and calculate mitigation potentials (MIT)**

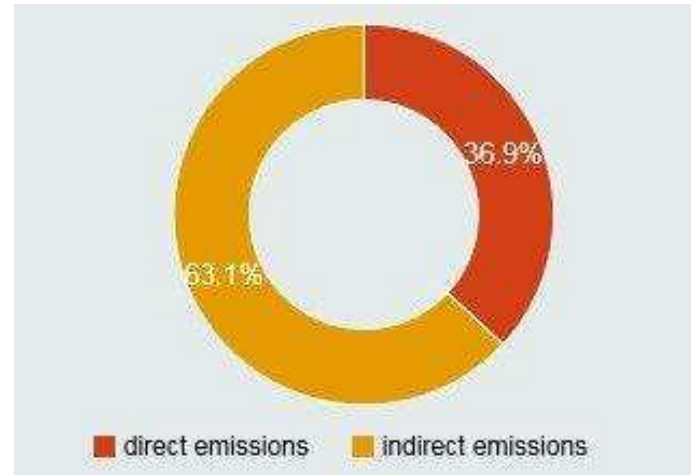


## Business as usual and mitigation scenario until 2030 (in Mt CO<sub>2</sub>eq) for Namibia (estimate)

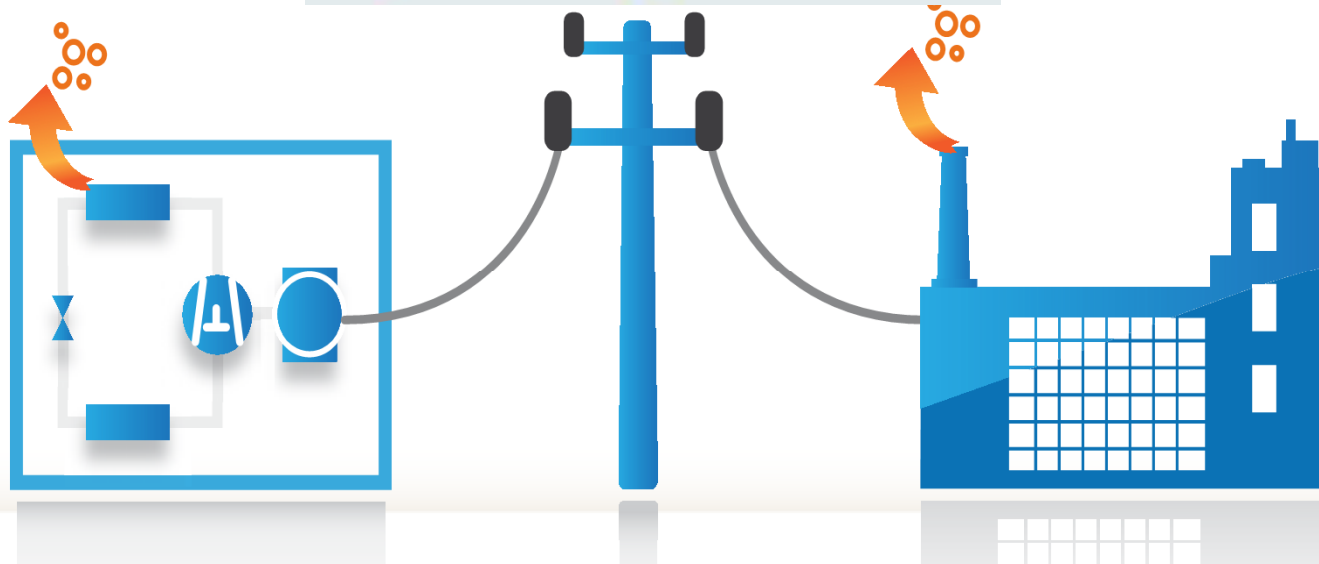


## Est. direct and Indirect Emissions in 2015 for Namibia

Cooling  
 → Direct Emissions  
 Refrigerants, HCFC/HFC



Electricity Production  
 → Indirect Emissions  
 CO<sub>2</sub>





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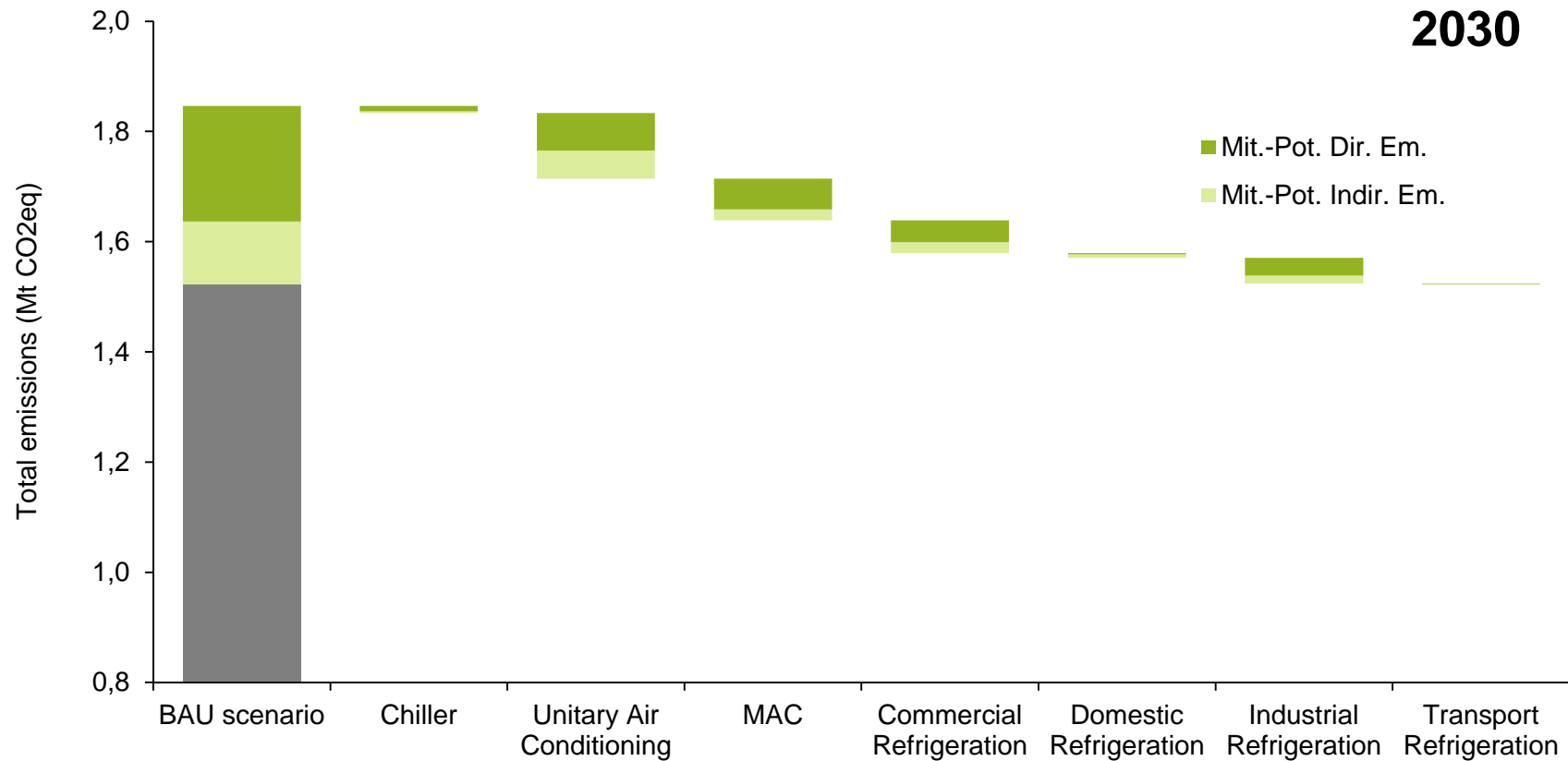
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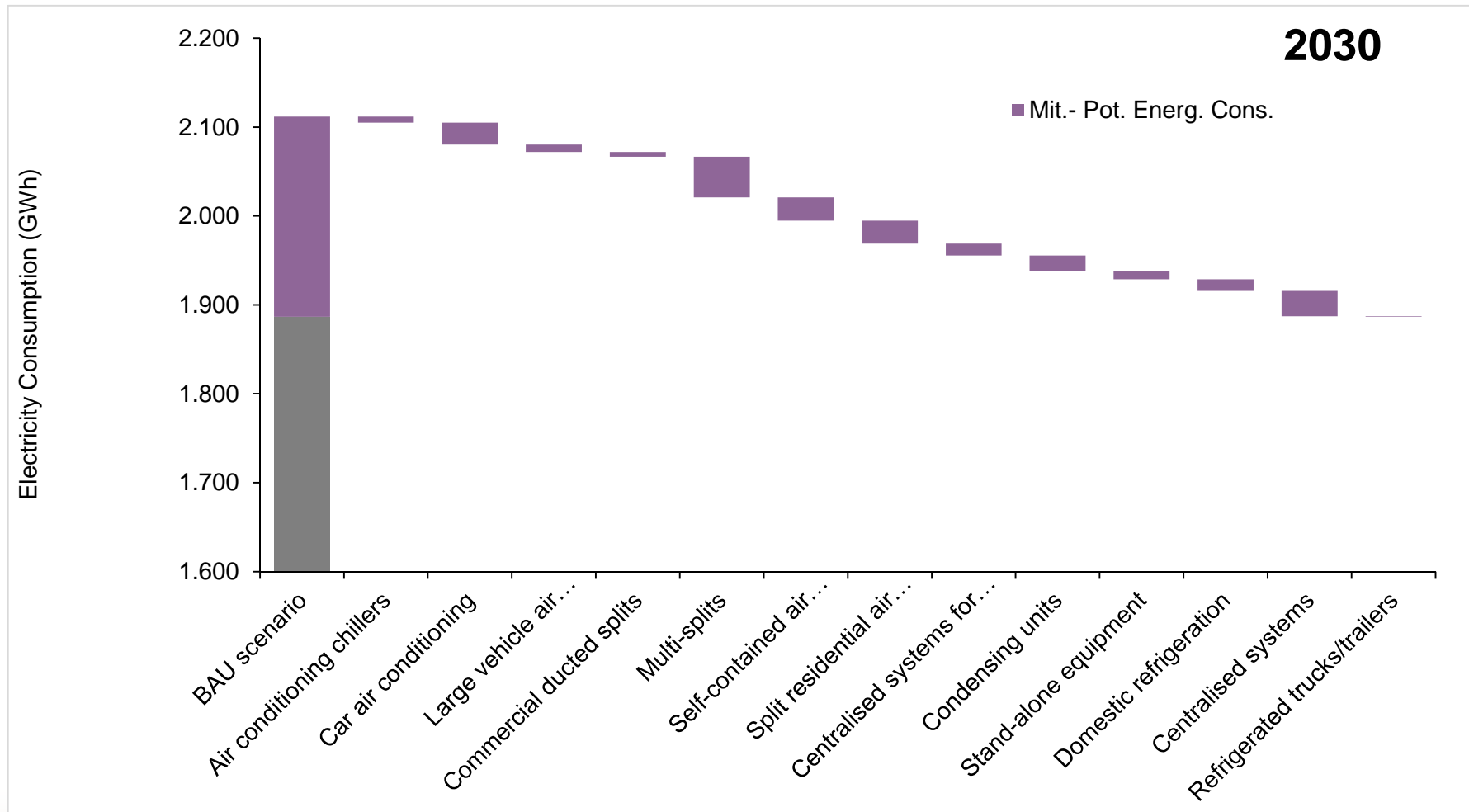
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## Potential energy savings in Namibia in Mt CO<sub>2</sub>eq p.a.



## Mitigation energy saving potential in Namibia in GWh p.a.



## Output 3

### Policy and regulatory framework recommendations

- Support policy development that promotes adoption of low emission technologies in the cooling sector and provide recommendations
- Link to Nationally Determined Contributions (NDC)
- Provide technical expertise on state-of-the-art standards and guidelines (e.g. safe use of natural refrigerants, MEPs)
- Recommend fiscal measures and green financing support (tax incentives, variable import duty structures) which can be adopted for promoting use of low emission technologies (learn from EU HFC-phase down)

## Output 4

### National and regional technology roadmap recommendations

- Develop milestone based action plans to bring about a systematic change in technology applied to the cooling sector
- Explore possible funding options for bringing about such a change (MLF, GCF, GEF, NAMA) and apply for funding
- Support replication and application of project deliverables at a regional scale



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**Thank you!**

**Questions?**

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GIZ Proklima International

[www.giz.de/proklima](http://www.giz.de/proklima)

[www.green-cooling-initiative.org](http://www.green-cooling-initiative.org)