# Los sistemas de Medición, Reporte y Verificación – MRV

**olade**

Organización Latinoamericana de Energía
Latin American Energy Organization
Organisation Latino-americaine d'Energie
Organização Latino-Americana de Energia

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# Contenidos

1. Principios Generales
2. Sistemas de MRV de Emisiones de GEI
3. Vínculos

# 1. PRINCIPIOS GENERALES

# 1. Antecedentes

- EL MRV se origina en las negociaciones internacionales del cambio climático.

- COP 13, Bali 2007: decisión para mejorar las acciones de mitigación "*...las NAMAs por las Partes que son países en desarrollo en el contexto del desarrollo sostenible, aprobadas y facilitadas por tecnologías, financiamiento y creación de capacidad, de manera mensurable, reportable y verificable* ."

# Figure 1. Possible timeline for a smooth transition from the existing transparency system to the enhanced transparency framework
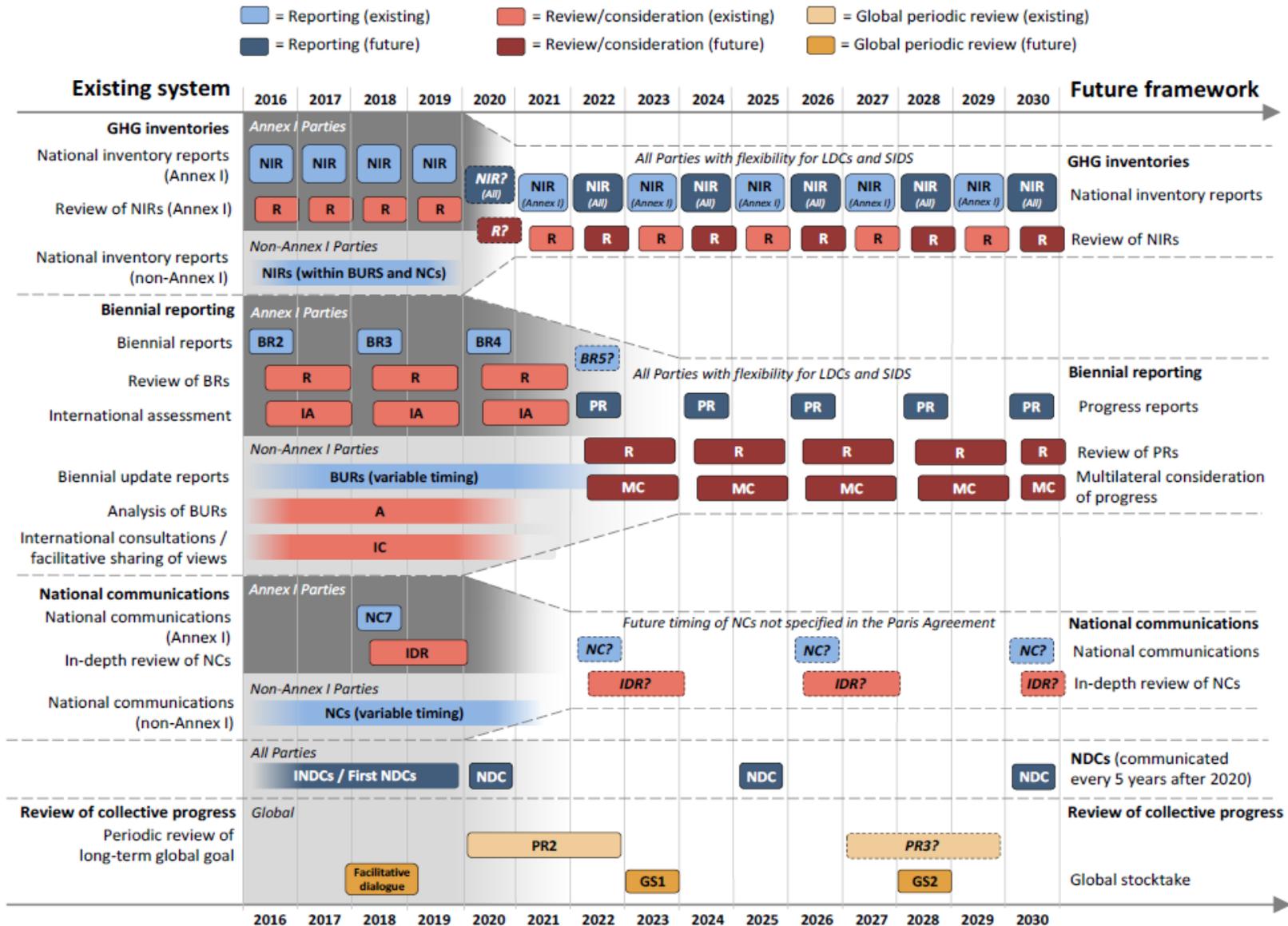


Notes: Annex I Kyoto Protocol Parties have supplementary reporting and verification arrangements under the Kyoto Protocol. Developed countries are also requested under the Durban work programme on long-term finance to report biennially on their strategies and approaches for scaling up climate finance from 2014 to 2020. The first periodic review of the long-term global mitigation goal took place in 2013-15. Note that processes to agree long-term climate finance goals are not shown in the figure.

20-Jun-17

*OECD, 2016: Unpacking Provisions Related to Transparency of Mitigation and Support in the Paris Agreement*

# 1. Por qué el MRV?

- Genera transparencia sobre el progreso de mitigación en curso, así como potencial y necesidades relacionadas en los países.

- Ayuda a cumplir con requerimientos de reportaje nacional a la CMNUCC

- Trae reconocimiento para el progreso nacional y genera confianza al nivel internacional, contribuyendo a un incremento del esfuerzo colectivo global hacia el cumplimiento del objetivo de 2 grados de calentamiento global

- Aumenta la probabilidad de obtener apoyo internacional y abre el camino para la participación en mercados de carbono

# 1. ¿Por qué el MRV? – Beneficios domésticos

- Facilita la toma de decisiones y la planificación nacional al identificar potenciales de reducción de GEI
- Brinda información para la priorización de acciones e inversión de recursos públicos y privados
- Ayuda a hacer seguimiento al cumplimiento de metas
- Apoya la implementación de NAMAs y genera información sobre sus impactos
- Promueve la coherencia de políticas y coordinación entre sectores emisores
- Genera información comparable y facilita su intercambio
- Destaca lecciones aprendidas, contribuye a la mejora continua de la calidad de acciones y ayuda a identificar y mostrar buenas prácticas

# Principios asociados con el MRV

- Transparentes

- Precisos

- Completos

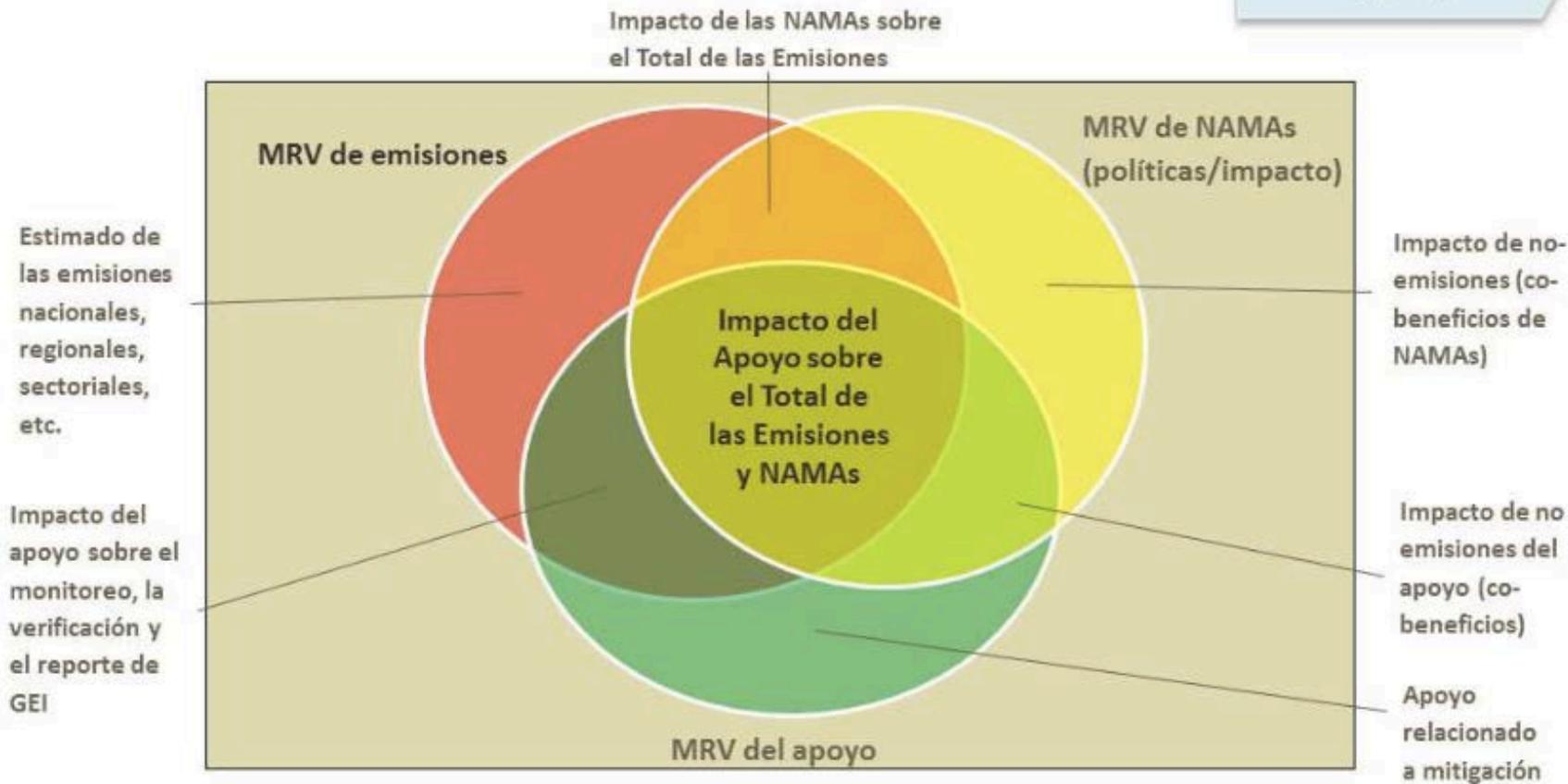- Consistentes

- Comparables

# 1. ¿Qué forma parte del MRV?

1. Emisiones (por ejemplo, Inventarios de GEI)

2. Impactos de políticas y acciones(comparados con una línea base)

3. Apoyo (p.ej. Financiamiento climático, la transferencia de tecnología, desarrollo de capacidades)
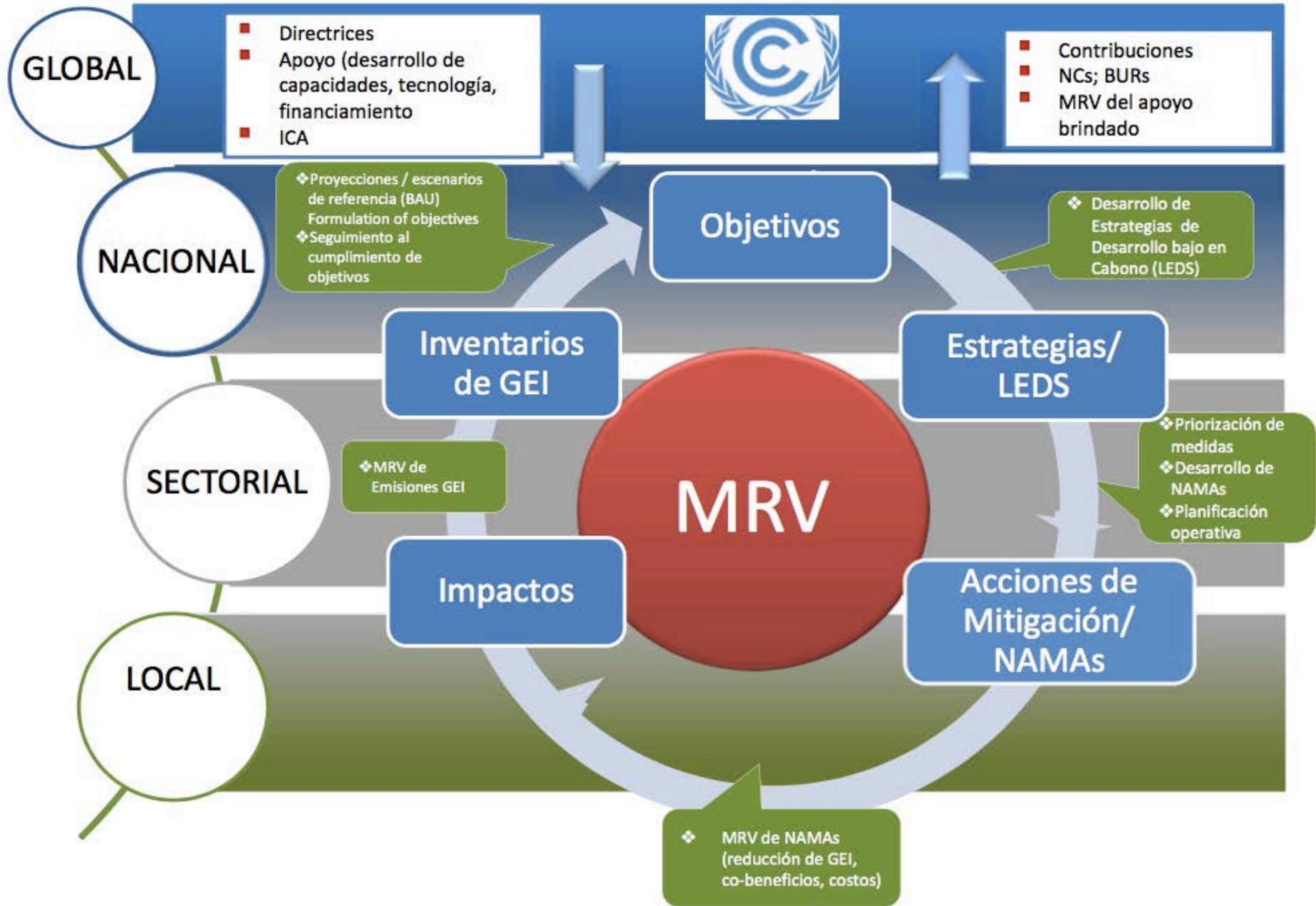
Emisiones de GEI

Medición, Reporte y Verificación

Impactos

Apoyo

*Fuente: GIZ, 2014. MRV tool*
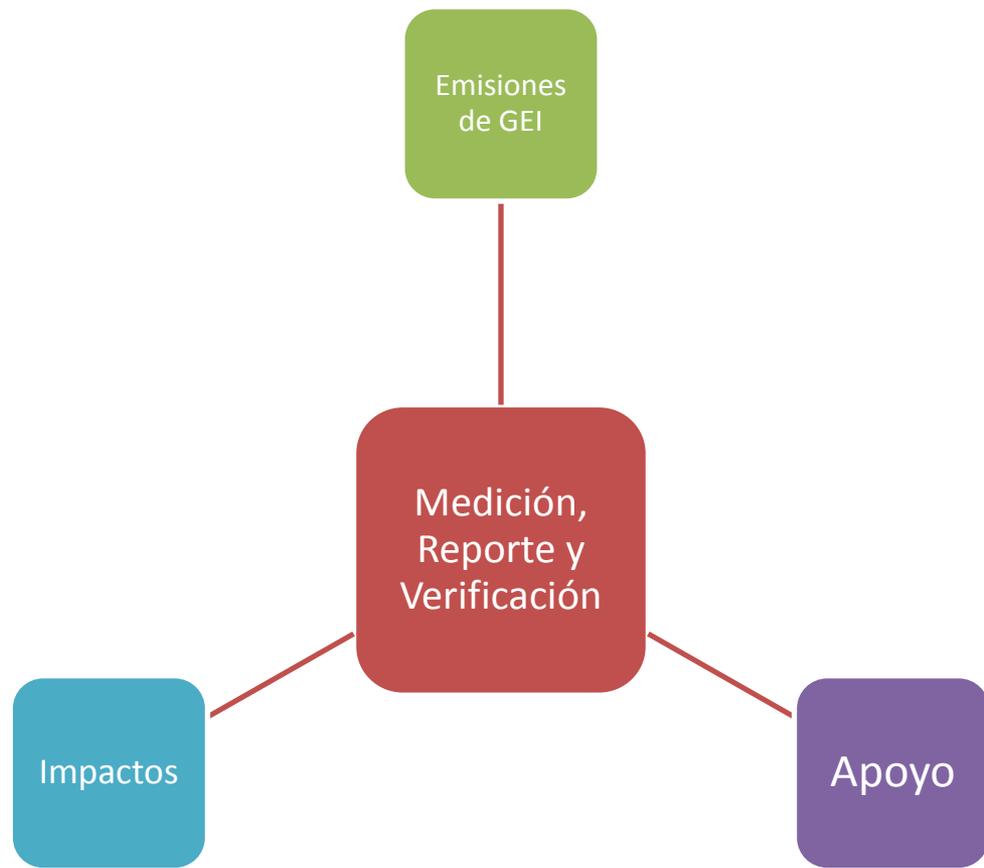
# El sistema nacional de MRV:
## Interacción entre MRV de emisiones, de NAMAs y de Apoyo

*Fuente: WB, 2014.MRV para NAMAs. PMR.*

# Líneas de Trabajo para el MRV de Chile

MRV del Compromiso Voluntario de Chile (NAMA Nacional)

MRV del Inventario Nacional de GEI

MRV de NAMAs domésticas

MRV de apoyo financiero

MRV en otras acciones relevantes, Proyecto PMR

# 2. MRV DE LAS EMISIONES DE GASES DE EFECTO INVERNADERO - GEI

# MRV de los niveles de emisión y de los impactos

- Utiliza metodologías simples y robustas
- Aplica indicadores SMART:
  - Específicos
  - Medibles
  - Alcanzables
  - Relevantes
  - Puntuales
- Usa escenarios de Línea Base que reflejen las condiciones locales para poder valorar los impactos
- Construye series de tiempo para los IGEI
- Establece estándares para los datos
- Considera desarrollar un sistema IT para el almacenamiento y evaluación de los datos

# MRV de las emisiones de GEI

## Tier - Nivel 1

Metodologías Simplificadas

Uso de datos disponibles

Uso de FE por default

## Tier – Nivel 2

Metodologías estandarizada

Procesos dedicados a la colección de datos

Nivel medio de detalle de los datos, i.e. Estadísticas

Factores de Emisión Nacionales

## Tier – Nivel 3

Metodologías que consideran adecuadamente las circunstancias nacionales

Datos con un nivel medio o detallado (compañía, instalaciones)
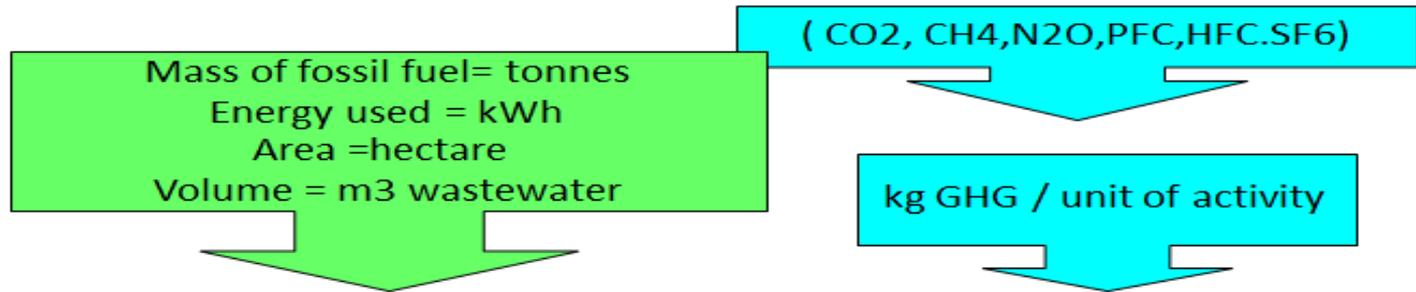
Fuentes nacionales específicas para los FE

Mediciones continuas de las emisiones

# Emisiones GEI, Indicadores de impacto y datos para Actividades de Mitigación – Tipo Programas y Proyectos

## Methodologies

( CO2, CH4,N2O,PFC,HFC.SF6)

Mass of fossil fuel= tonnes
Energy used = kWh
Area =hectare
Volume = m3 wastewater

kg GHG / unit of activity

Emission = Activity Data (AD) × Emission Factor (EF)

Tonnes CO2 equivalent of the estimated year

CO2 =1
CH4=21    N2O=310
HFC=  140-11700   PFC=  9200
SFC= 23900

# Parámetros para el sector de Vivienda y Edificaciones – NAMA Urbano CR

| Parameter | Unit | Frequency | Source | Direct | Indirect (survey) |
|---|---|---|---|---|---|
| Electricity consumption | kWh | Year | ICE/CNFL | X | |
| Distributed generation | kWh | Year | ICE/CNFL | X | |
| Gas LPG | m3 | Year | | | X |
| Water consumption | m3 | Year | AYA | X | |
| Water recycled | m3 | Year | | | X |
| Household size | persons | Two years | | | X |
| Housing size | m2 | Once | APC/CFIA | | |
| Carbon footprint | ton | Once | APC/CFIA | | |
| Water heater | Data sheet manufacturer | Once | | | X |
| Solar heater | | Once | | | X |
| Refrigerator | | Once | | | X |
| Appliances | | Once | | | X |
| Lighting | | Once | | | X |
| Real estate added value | $ | Two years | Municipal | | X |
| RESET    independent | | Once | APC/CFIA | X | |

# Frecuencia de los parámetros

| Parameter | Unit | Frequency | Direct | Indirect (survey) |
|---|---|---|---|---|
| Power consumption | kWh | Hourly | X | |
| Water consumption | Ltr/pax/day | Hourly | X | X |
| Interior temperature | °C | Hourly | X | |
| Exterior temperature | °C | Monthly | X | |
| Interior humidity | % | Hourly | X | |
| Exterior humidity | % | Monthly | X | |
| Air conditioned | kWh | Hourly | X | |
| Lighting energy | kWh | Hourly | X | |
| Appliances energy | kWh | Hourly | X | |
| Shower | Ltr/pax/day | monthly | | X |
| Kitchen faucets | y frequency | | | X |
| Laundry | | | | X |

# MRV de las emisiones de GEI

## Tier - Nivel 1

Lista requerida de los contenidos de los reportes

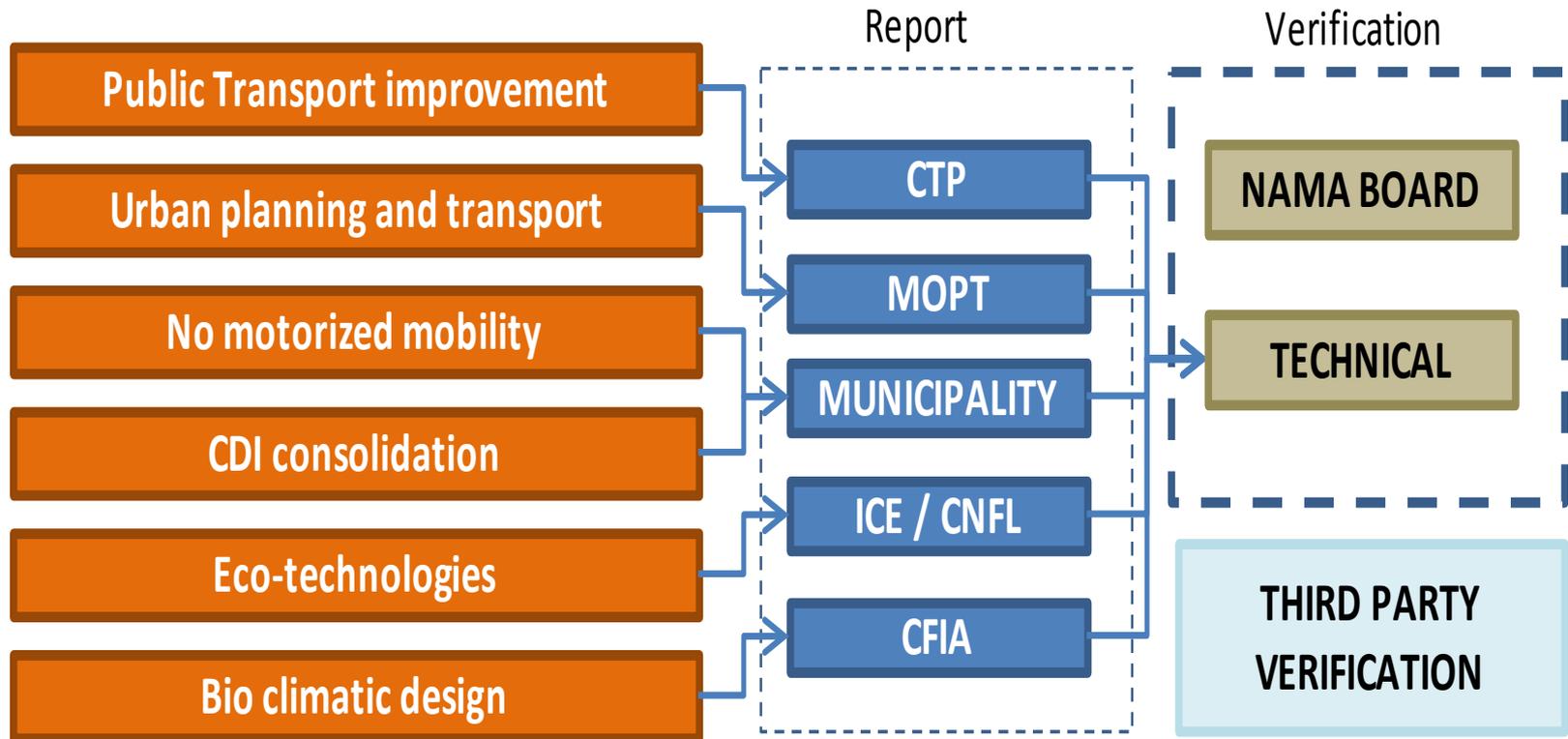Reporte en papel y o electrónico

## Tier – Nivel 2

Proveer de un reporte o plantilla para el el Reporte

Reporte en formato electrónico

## Tier – Nivel 3

Formato obligatorio de Reporte

Herramientas sofisticadas de Reporte que tengan la posibilidad de comprobación cruzada

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# Marco Institucional para el Reporte y Verificación de la NAMA Urbana

Report

Verification

**Public Transport improvement**

**Urban planning and transport**

**No motorized mobility**

**CDI consolidation**

**Eco-technologies**

**Bio climatic design**

**CTP**

**MOPT**

**MUNICIPALITY**

**ICE / CNFL**

**CFIA**

**NAMA BOARD**

**TECHNICAL**

**THIRD PARTY VERIFICATION**

# MRV de las emisiones de GEI

## Tier - Nivel 1

Validación Interna basada en chequeos plausibles

## Tier – Nivel 2

Validación por potra entidad Doméstica (Administración e institucional)

Chequeos plausibles basados en información de base

## Tier – Nivel 3

Validación por una entidad tercer e independiente

Chequeos plausibles basados en información de base y en una evaluación de los procesos internos

**Parámetros para el Transporte Público – NAMA URBANO CR**

| Indicator | Monitoring | Verification |
|---|---|---|
| GHG per year (MtCO2/year) | Fuel consumption multiplied by emission factor<br>Kilometers avoided | Compare estimated emissions with actual emissions |
| Kilometers BRT lanes built per year (km/year) | Official Register of kilometers built confined lane (BRT) | Verification of the operation of the running BRT lanes. |
| Kilometers traveled by the BRT system (km / year). | Official record of kilometers traveled by the BRT system per year | Verification of travel records system with reports |
| Number of vehicles subject to parking meters per year (vehicles / year) | Operator Databases of parking meters | Verification of the system operator, and contrast it with a representative sample of parking meters, as well as verification of the operation of parking meters |
| Frequency of use of parking meters per year | The operator records the number of times a vehicle uses a meter per year, calculating the statistical frequency of all vehicles using parking meters. The uses of a survey of modal shift in transport to complement this parameter in order to determine if users are recommended to use the car stop as preferred transport. | Check that the data are consistent with reports of operator systems and meter, as well as the methodology of the survey. |
| Average occupancy of vehicles (passenger / vehicle / year) | The new public transport systems will need to have registration and control systems linked to databases. This includes the number of passengers per vehicle per year. | Check through a representative sample of routes records a vehicular occupation period. |
| Optimization of transport routes | Number optimized routes | Checking the number of optimized routes against the general plan optimization |
| Fuel consumption (liters per year) | Bus operators recorded fuel consumption | Verify the reduction in consumption, and, if applicable, identify deviations and correct. |
| Number of hybrid buses and biodiesel | Database bus sales | Verification and cross-checking |
| Kilometers covered | The operator of the public bicycle | Check with a representative sample |

# Descripción detallada de indicadores a ser MRV

- Se realizó una identificación de parámetros para monitorear el progreso de la implementación de la NAMA

| No | OUTPUT OF THE NAMA | INDICATORS / PARAMETERS | QUALITATIVE OR QUANTITATIVE | UNITS |
|---|---|---|---|---|
| 1 | **Elaborate the NAMA proposal and seek of international funding for the NAMA components to be supported.** | | | |
| 1.1 | Elaboration of the first NAMA proposal | Versions of the NAMA Document | Quantitative | Numbers of versions |
| 1.2 | Further improving of the NAMA proposal for submission to different NAMA funds, such as the NAMA Facility or any other fund. | E-mail or other written proof that states that the NAMA was submitted to different NAMA Funds | Qualitative | Written proof |
| 2 | **The institutional framework for the SWH NAMA has been settled.** | | | |
| 2.1 | Establish the NAMA Roundtable or NAMA Working Group | NAMA Roundtable was established. | Qualitative | Ministerial Decree or any other legal resolution or an interinstitutional Agreement. |
| 2.2 | Define the NAMA coordinating Unit or the NAMA Manager | NAMA coordinating Unit has been established and it is operational. | Qualitative | Ministerial Decree or any other legal resolution. |
| 2.3 | Establish the NAMA Board | NAMA Board established and it is operational | Qualitative | Ministerial Decree or any other legal resolution. |
| 2.4 | Define the institutions that will be NAMA implementers | NAMA implementers have been selected and they have started its operations. | Quantitative | Legal contracts signed. |
| 2.5 | Determine what institutions will be involved in the Monitoring of the GHG emissions as well as in the Report. | The NAMA implementers are conducting the GHG monitoring. | Quantitative | GHG records of GHG measurements and GHG estimations. |
| 2.6 | Define the institutions that will conduct the verification process for the domestic efforts and for the international supported component of the NAMA. | The national institution, which is responsible of the verification process, has been selected and it is conducting the verification process. | Qualitative | Supreme Decree or legal contract signed with the national institution responsible to conduct the verification process. |
| 3 | **Establishment of State funds to finance SWH units, the installation and maintenance costs required for the SWH to be deployed for the domestic efforts of the NAMA.** | | | |
| 3.1 | The Plurinational State of Bolivia generates programmes for covering the installation costs of the SWH in the low-income households. | Bolivia has at least one programme, which is covering the installation costs for low-income households | Quantitative | Number of assistance programmes established on SWH. |
| 3.2 | The Plurinational State of Bolivia allocates funds coming from the national budget through specific programmes of housing and electricity. | Bolivia has allocated budget or specific funds for SWH programmes. | Quantitative | National budget allocated for SWH programmes. |
| 3.3 | Bolivia allocates specific grants to subsidy the installation costs of SWH for the rural households and for the Low-income households as part of the Patriotic Agenda goals. | Grants or subsidies allocated to cover the installation costs of SWH in the rural area and in the low-income urban households. | Quantitative | Number of grants or subsidies. |

# Plan de MRV para el NAMA de SWH

| No | IMPACT INDICATORS (GHG REDUCTION, SD BENEFITS) | BASELINE | YEAR 2015 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | FREQUENCY AND REPORTS | DATA COLLECTION INSTRUMENTS | RESPONSIBILITY FOR DATA COLLECTION |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | **GHG EMISSION IMPACTS** | | | | | | | | | | | | | | | | | | | | |
| **1.** | **BASELINE SCENARIO** | | | | | | | | | | | | | | | | | | | | |
| 1.1 | Population Size | Population's size of 2013 | | | | | | | | | | | | | | | | | Every 5 to 10 years | Population Census | INE |
| 1.2 | Number of households in Bolivia, categorised by urban and rural areas | Household characterisation of 2013 | | | | | | | | | | | | | | | | | Every 5 to 10 years | Household surveys | INE |
| 1.3 | Number of households with access to water and electricity | Number of households of 2013 | | | | | | | | | | | | | | | | | Every year or every two years | Household surveys and next census of population | INE |
| 1.4 | Average number of people per household | Number of people per household by 2012 | | | | | | | | | | | | | | | | | Every 5 to 10 years | Household surveys and next census of population | INE |
| 1.5 | Number of household with shower(s) | Household surveys and census of 2012 | | | | | | | | | | | | | | | | | Every year or every two years | Household surveys and next census of population | INE, NAMA implementers |
| 1.6 | Shower frequency per person per week | Household survey 2016 | | | | | | | | | | | | | | | | | Every year or every two years | Household survey | INE, NAMA implementers |
| 1.7 | Shower frequency per household per month | Household survey 2016 | | | | | | | | | | | | | | | | | Every year or every two years | Household survey | INE, NAMA Implementers |
| 1.8 | Time of daily use of shower per household | Household survey 2016 | | | | | | | | | | | | | | | | | Every year or every two years | Household survey | INE, NAMA Implementers |
| 1.9 | Wattage of showers | Shower market survey | | | | | | | | | | | | | | | | | Every year | Producer brochure Registration of imports | Technology providers Customs NAMA CU |
| 1.10 | Daily energy consumption of shower per household | Household survey 2016 | | | | | | | | | | | | | | | | | Every year or every two years | Producer brochure Survey | INE, NAMA Implementers |
| 1.11 | Average electricity consumption of showers per household | Shower energy consumption test or survey 2016 | | | | | | | | | | | | | | | | | Every two year | Producer brochure Test of shower energy consumption | Technology providers NAMA Implementers |

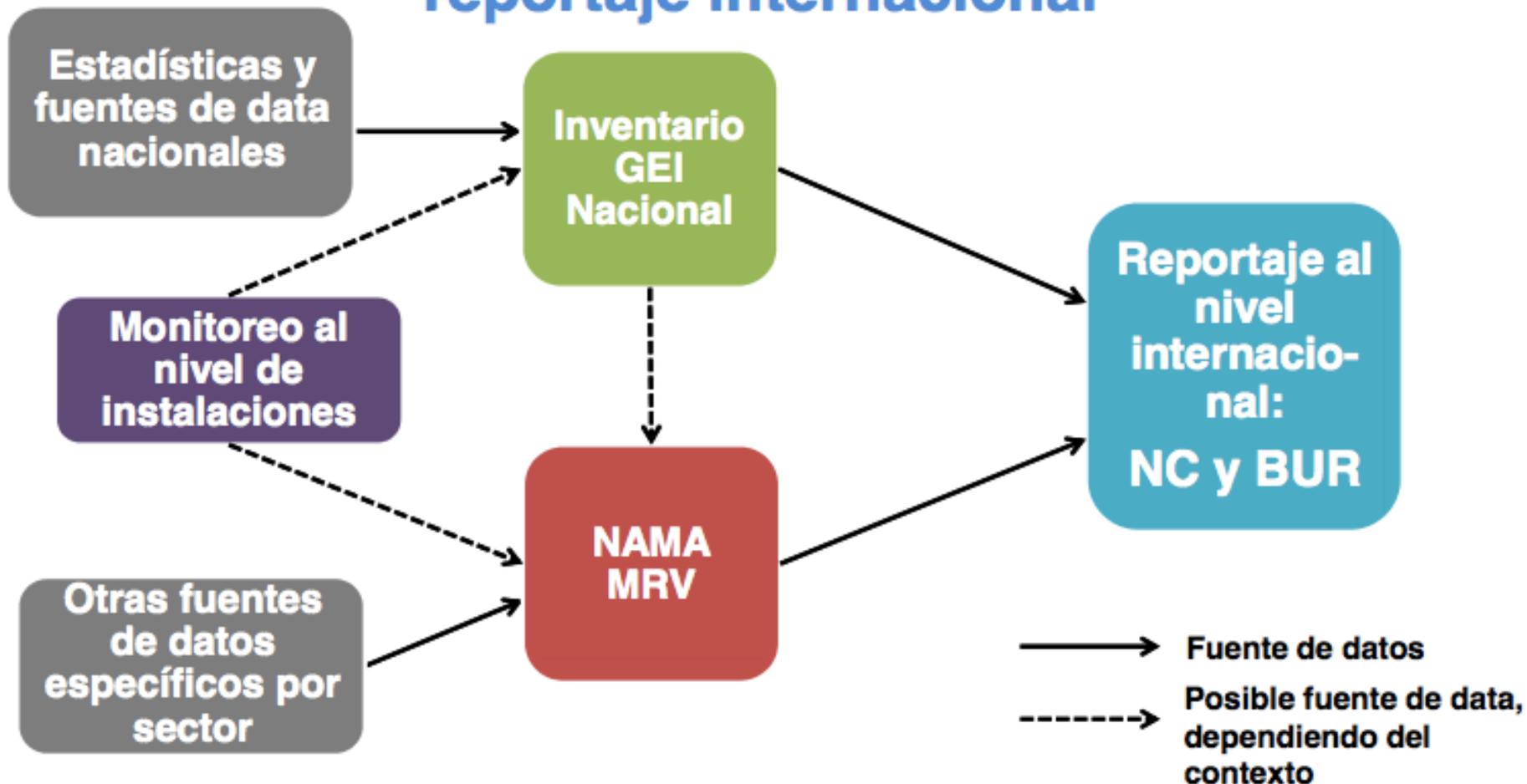# 3. VÍNCULOS ENTRE LOS SISTEMAS DE MRV

*Fuente: WB, 2014.MRV para NAMAs. PMR.*
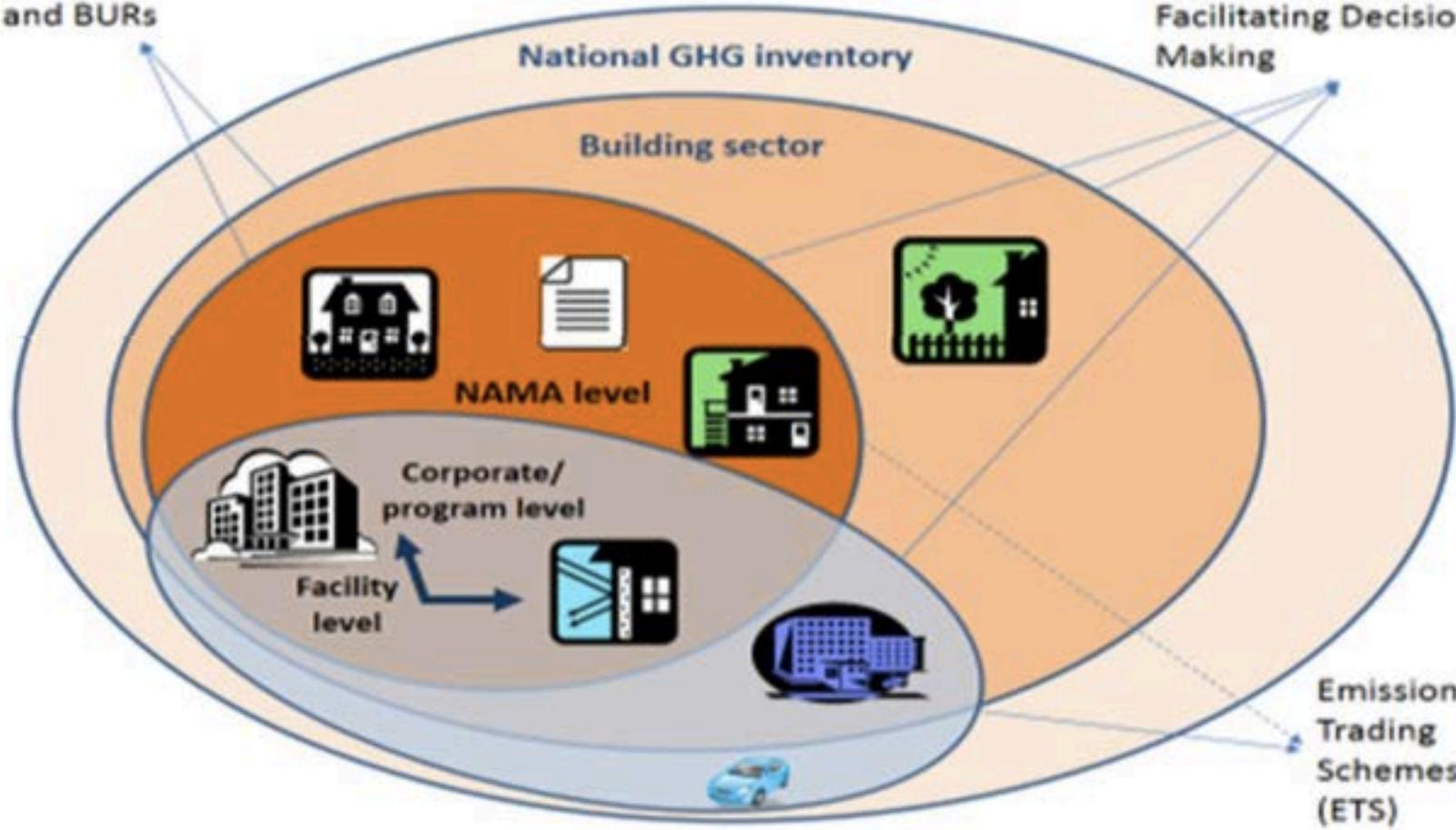
Enlaces entre sistemas nacionales de MRV y reportaje internacional

Fuente: WB, 2014. MRV para NAMAs. PMR.

*Fuente: IGES, 2013.*

# MRV en India - EE

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