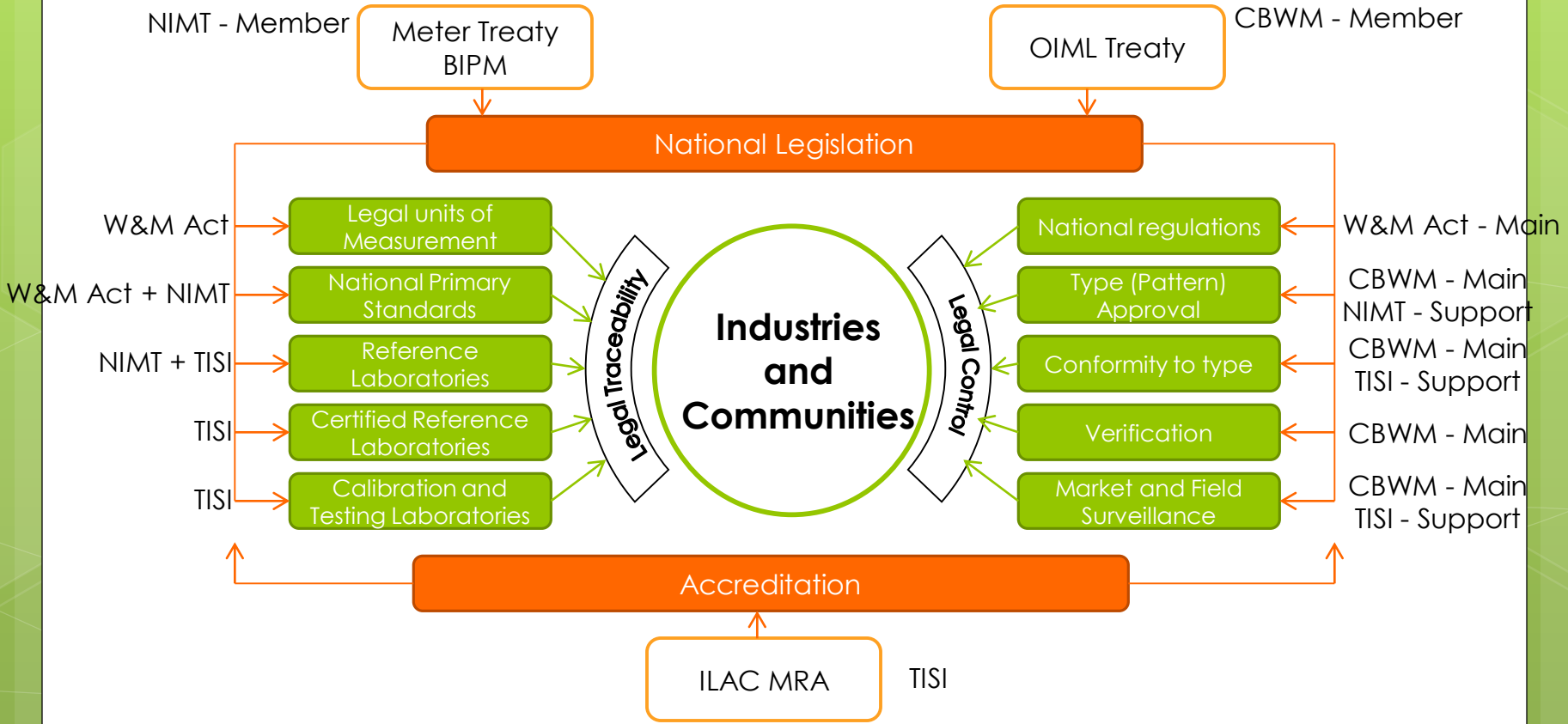




Thailand's Legal metrology infrastructure

Mr. Chartree Areewong
Central Bureau of Weights &
Measures
Department of Internal Trade
Ministry of Commerce, Thailand

National Legal Metrology Infrastructure



National institutes

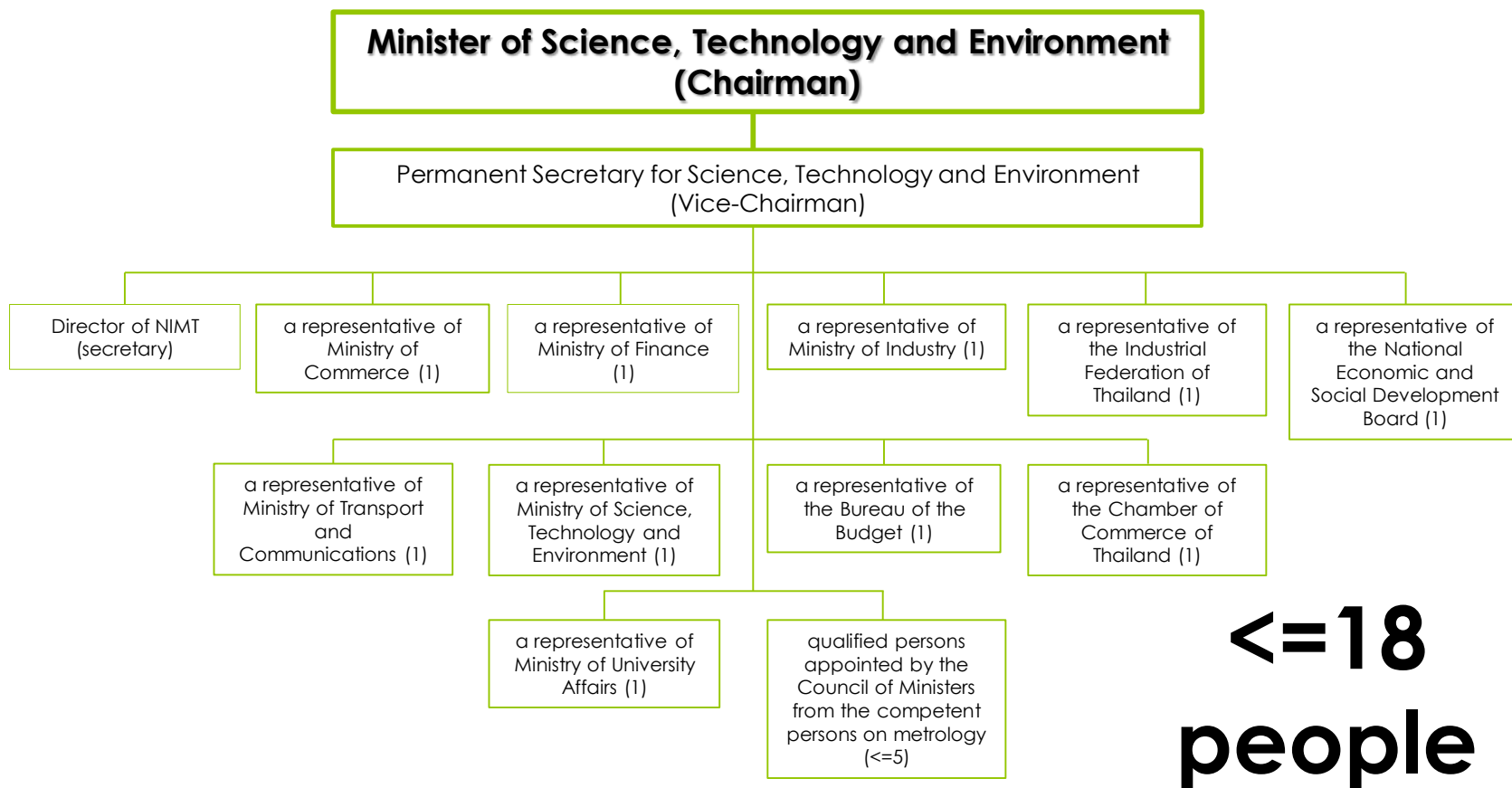
NIMT

- NMI
- Ministry of Science, Technology and Environment
- National Metrological System Development Act, B.E. 2540.
- Metrologist (196), Staff (65)
- Government and service funded

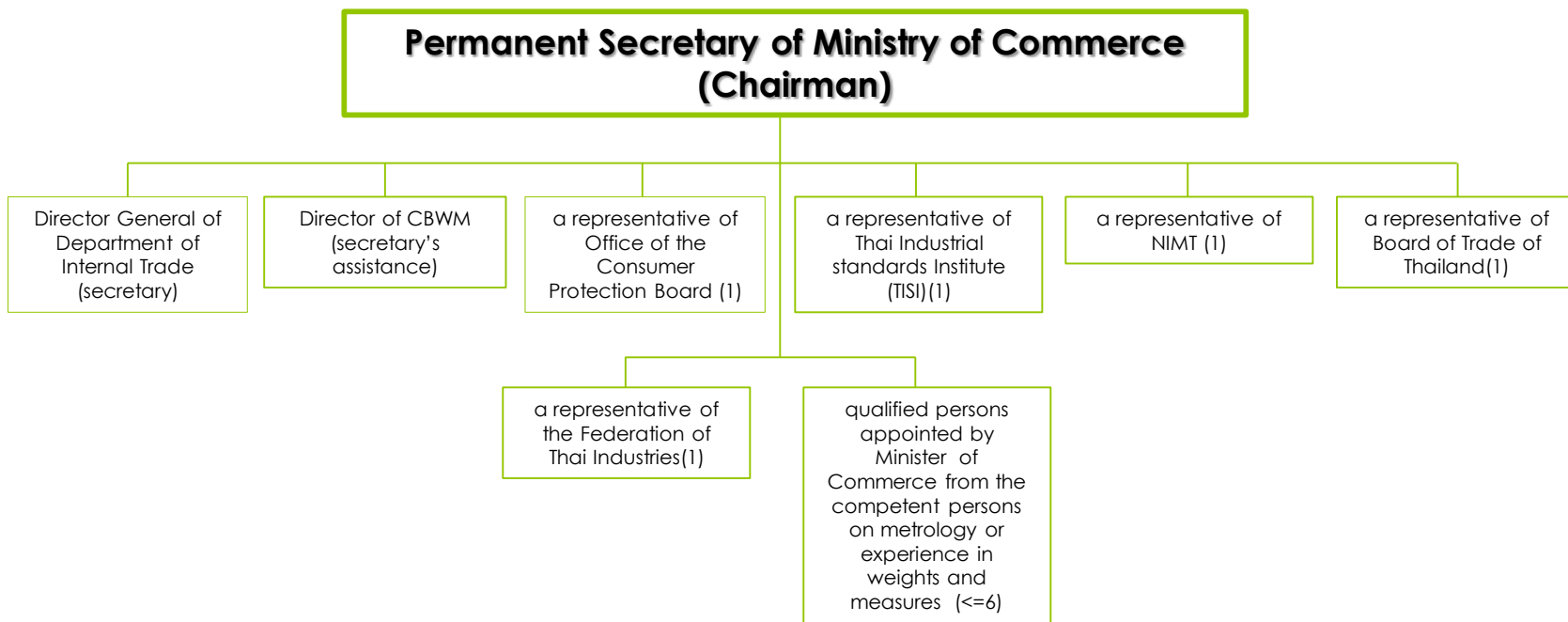
CBWM

- NLMI
- Department of Internal Trade, Ministry of Commerce
- Weights and Measures Act, B.E. 2542
- Permanent (154), Temporary (193)
- Government funded

Board of the National Metrology (NIMT)

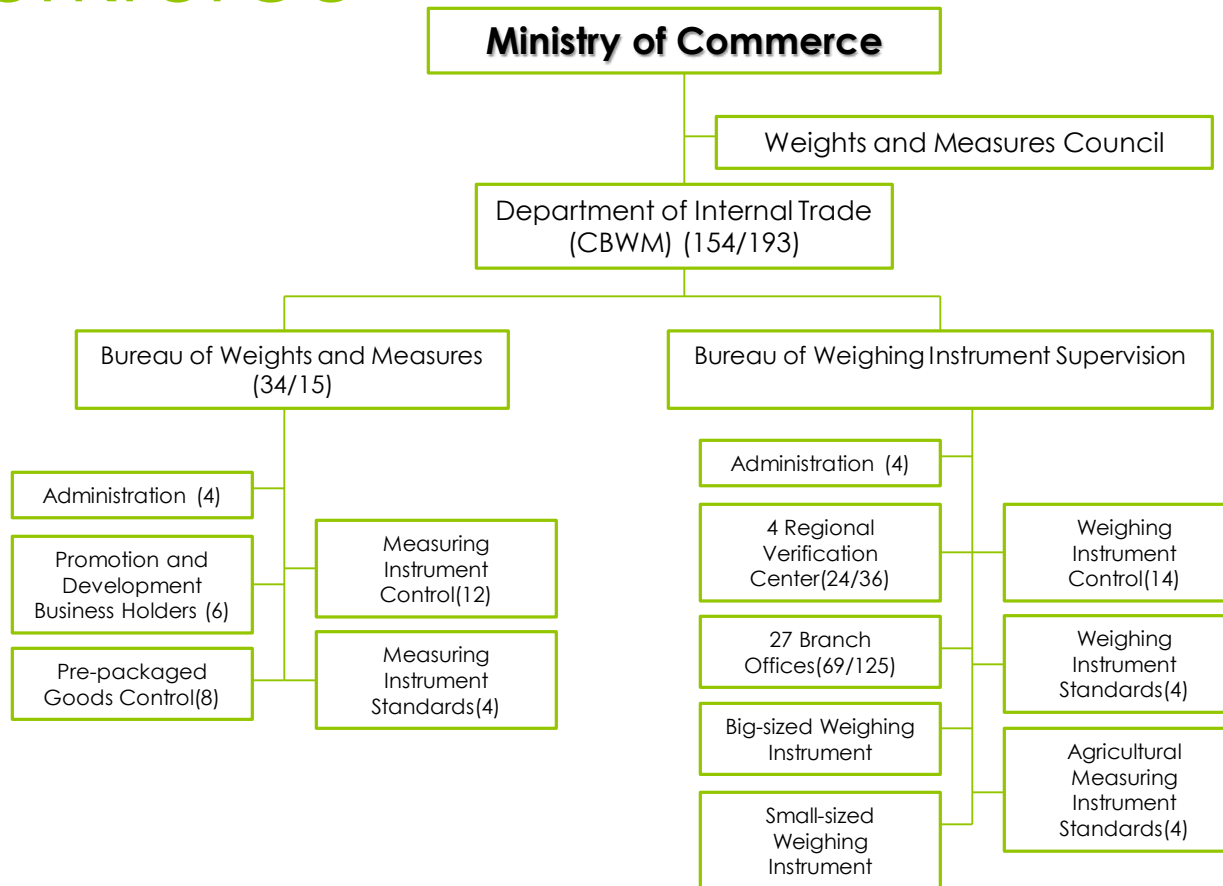


Weights and Measures Council (CBWM)



**<=14
people**

Organization chart and workforce



Human Resources

Permanent (154)

- Master degree: Engineer, Science, Economic (25)
- Bachelor (112)
- Diploma (17)

Temporary (193)

- Bachelor (152)
- Diploma (41)

Legal unit – General provision

Section 9 All Weights and Measures shall be the Metric System of Weights and Measures or the System in customary use adapted to the Metric System prescribed in the annex to this Act.

Section 10 If the Minister considers it is appropriate, for the purchase, selling, or distribution of any commodity in any area, to use the Metric System of Weights and Measures pursuant to Section 9 or to be conducted by weights, by volume, or by measurement, he shall have the power to issue Notifications

The Notifications issued under the first paragraph shall take effect upon publication in the government Gazette

THE ANNEX UNDER SECTION 9

A. Weights and Measures in the Metric System

(1) The fundamental unit of length shall be the Metre, defined as the length of the path traveled by light in vacuum during a time interval of $1/299\,792\,456$ of a second.

The legal units of length shall be as follows:

NAME	VALUE	ABBREVIATION
Kilometre	One thousand metres	km
Hectometre	One hundred metres	hm
Decametre	Ten metres	dam
Metre	Fundamental unit	m
Decimetre	One tenth of a metre	dm
Centimetre	One hundredth of a metre	cm
Millimetre	One thousandth of a metre	mm
Micron	One thousandth of a millimetre	mm

(2) The unit of area shall be the Square Metre, defined as the area of a square of side one metre.

The legal units of area shall be as follows:

NAME	VALUE	ABBREVIATION
Square kilometre	One million square metres	km ²
Square hectometre or hectare	Ten thousand square metres	hm ²
Square decametre	One hundred square metres	dam ²
Square metre	One square metre	m ²
Square decimetre	One hundredth of a square metre	dm ²
Square centimetre	One ten thousandth of a square metre	cm ²
Square millimetre	One millionth of a square metre	mm ²

(3) The unit of volume shall be the Cubic Metre, defined as the volume of a cube of side one metre.

The legal units of volume shall be as follows:

NAME	VALUE	ABBREVIATION
Cubic kilometre	One thousand million cubic metres	km ³
Cubic hectometre	One million cubic metres	hm ³
Cubic decametre	One thousand cubic metres	dam ³
Cubic metre	One cubic metre	m ³
Cubic decimetre	One thousandth of a cubic metre	dm ³
Cubic centimetre	One millionth of a cubic metre	cm ³
Cubic millimetre	One thousandth of a cubic centimetre	mm ³

(4) The unit of capacity shall be the Litre, defined as the volume of one kilogramme of pure water at the temperature of 4 C and under normal atmospheric pressure.

The legal units of volume shall be as follows:

NAME	VALUE	ABBREVIATION
Kilolitre	One thousand litres	kl
Hectolitre	One hundred litres	hl
Decalitre	Ten litres	dal
Litre	One litres	l
Decilitre	One tenth of a litres	dl
Centilitre	One hundredth of a litres	cl
Millilitre	One thousandth of a litres	ml

For all purposes of indicating a volume, one Litre may be considered identical with one Cubic Decimetre.

(5) The fundamental unit of mass shall be the Kilogramme, defined as the unit of mass, which is equal to the mass of the International Prototype of the Kilogramme.

The legal units of mass shall be as follows:

NAME	VALUE	ABBREVIATION
Metric ton	One thousand Kilogrammes	t
Metric quintal	One hundred Kilogrammes	q
Kilogramme	Fundamental unit	kg
Hectogramme	One hundred grammes	hg
Decagramme	Ten grammes	dag
Gramme	One thousandth of a Kilogramme	g
Decigramme	One tenth of a gramme	dg
Centigramme	One hundredth of a gramme	cg
Milligramme	One thousandth of a gramme	mg
Microgramme	One thousandth of a milligramme	mg

For all purposes of indicating a weight, a unit of mass of any object shall be considered identical with a unit of weight of that object.

(6) The fundamental unit of time shall be the Second, defined as the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium-133 atom.

(7) The fundamental unit of electric current shall be the Ampere, defined as amount of constant current which, if maintained in two straight parallel conductors of infinite length, of negligible circular cross-section, and placed one metre apart in vacuum, would produce, between these two conductors, a force of 2×10^{-7} Newton per metre of length.

(8) The fundamental unit of thermodynamic temperature shall be the Kelvin, which is the fraction $1/273.16$ of the thermodynamic temperature of the triple point of water.

The Kelvin unit should be used to express an interval or a difference of temperature.

In dealing with any business, the degree Celsius may be used as the unit of temperature.

The Celsius temperature is the thermodynamic temperature decreased by 273.15.

(9) The fundamental unit of amount of substance shall be the Mole, defined as the amount of substance of a system, which contains as many elementary entities as there are atoms in 0.012 kilogramme of carbon-12. When the Mole is used, the elementary entities must be specified and may be atoms, molecules, ions, electrons, other particles, or specified groups of such particles.

(10) The fundamental unit of Luminous Intensity shall be the Candela, defined as the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540×10^{12} Hertz and that has a radiant intensity in that direction of 1/683 watt per steradian.

Legal unit – Offences and Penalties

Section 66 Any person who uses any Weights and Measures other than those prescribed in **Section 9** for buying, selling, or distributing commodities shall be liable to a fine not exceeding 5,000 baht.

Section 67 Any person who uses any Weights and Measures or commits weighing or measuring any commodity for buy, sale, or distribution, which are not in conformity with the Ministerial Notifications issued under **Section 10**, shall be liable to a fine not exceeding 5,000 baht.

National Legal Metrology Policy

- Not yet clearly presented
- Since CBWM is the only Legal Metrology Authorities of Thailand, CBWM will be the person who develop the National Legal Policy.

Functions and Responsibilities

- Supervision of Business Holders
- Control of Weighing and Measuring Instruments
- Control of Pre-Packaged Goods
- Custodian of Weighing and Measuring Standards

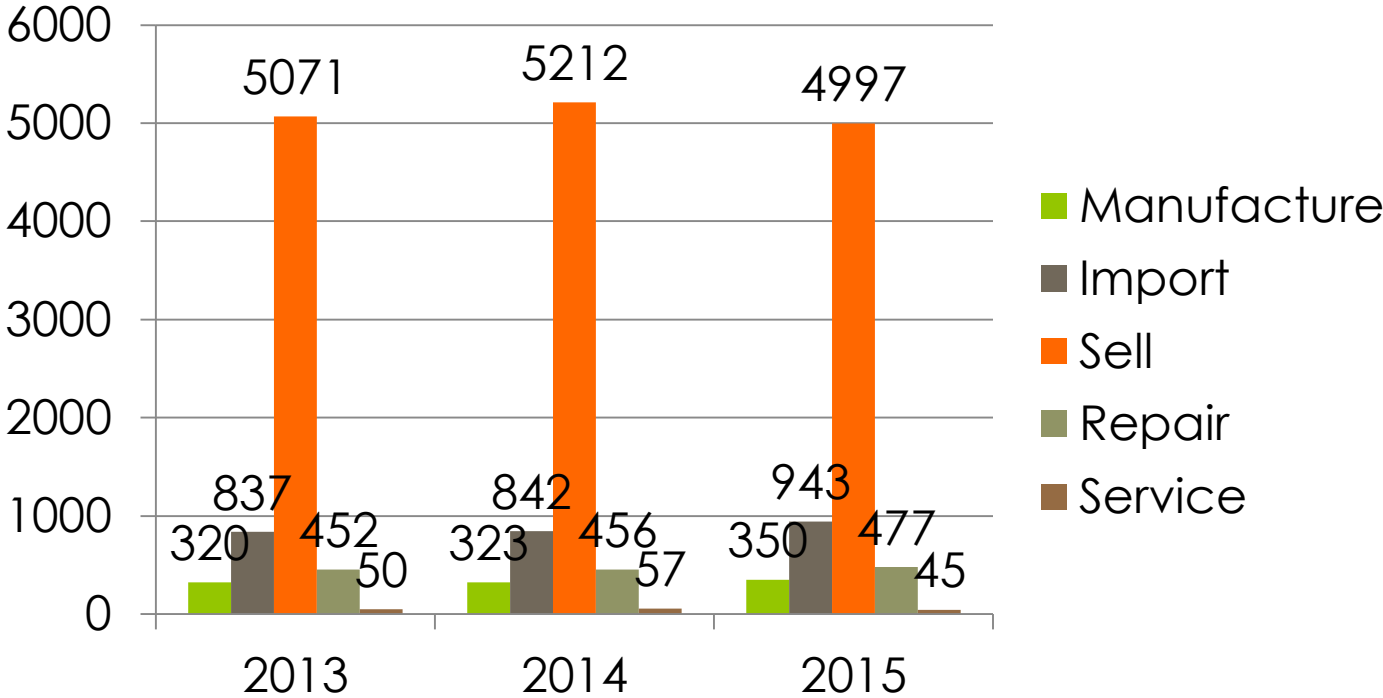
Current situation

- Instruments used for trade
- Workload
- Official is operator, not regulator
- Verification-inspection

Future

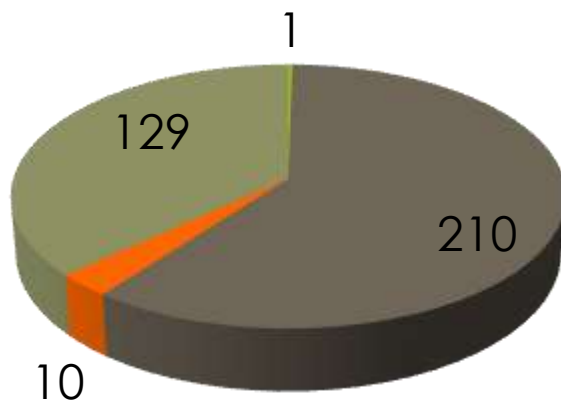
-
- Official is regulator, not operator
- Type approval-conformity assessment
- Notify bodies
- All kinds of weighing and measuring instrument
- Professional officials
- Self funded

Number of Business holder

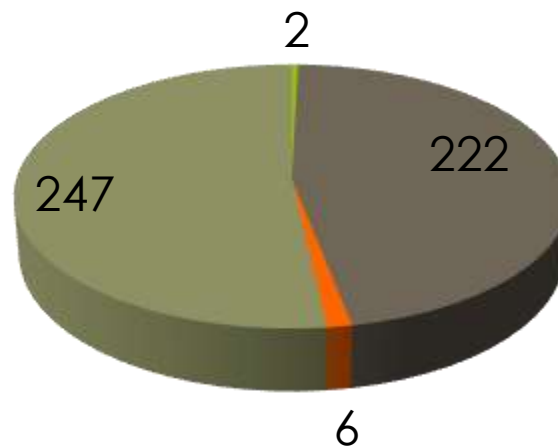


Year 2015 – Number of Business Holder

Manufacture



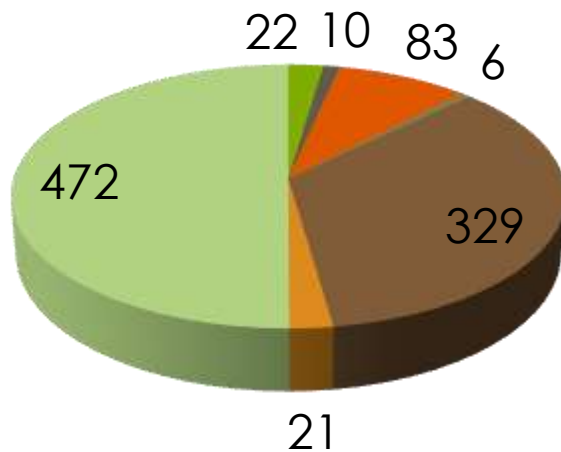
Repair



- Volume and Measuring instruments
- Weighing instruments
- Volume instruments
- Measuring instruments

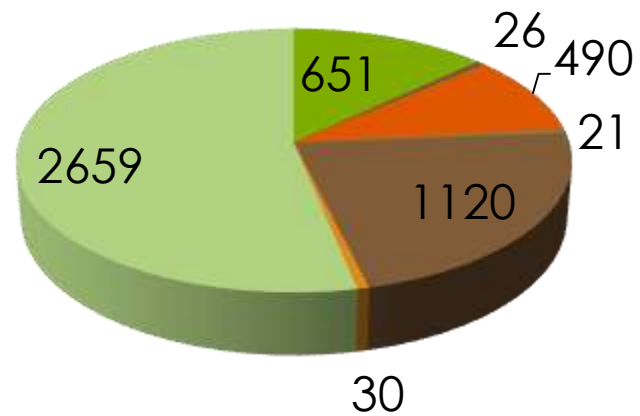
Year 2015 – Number of Business Holder

Import



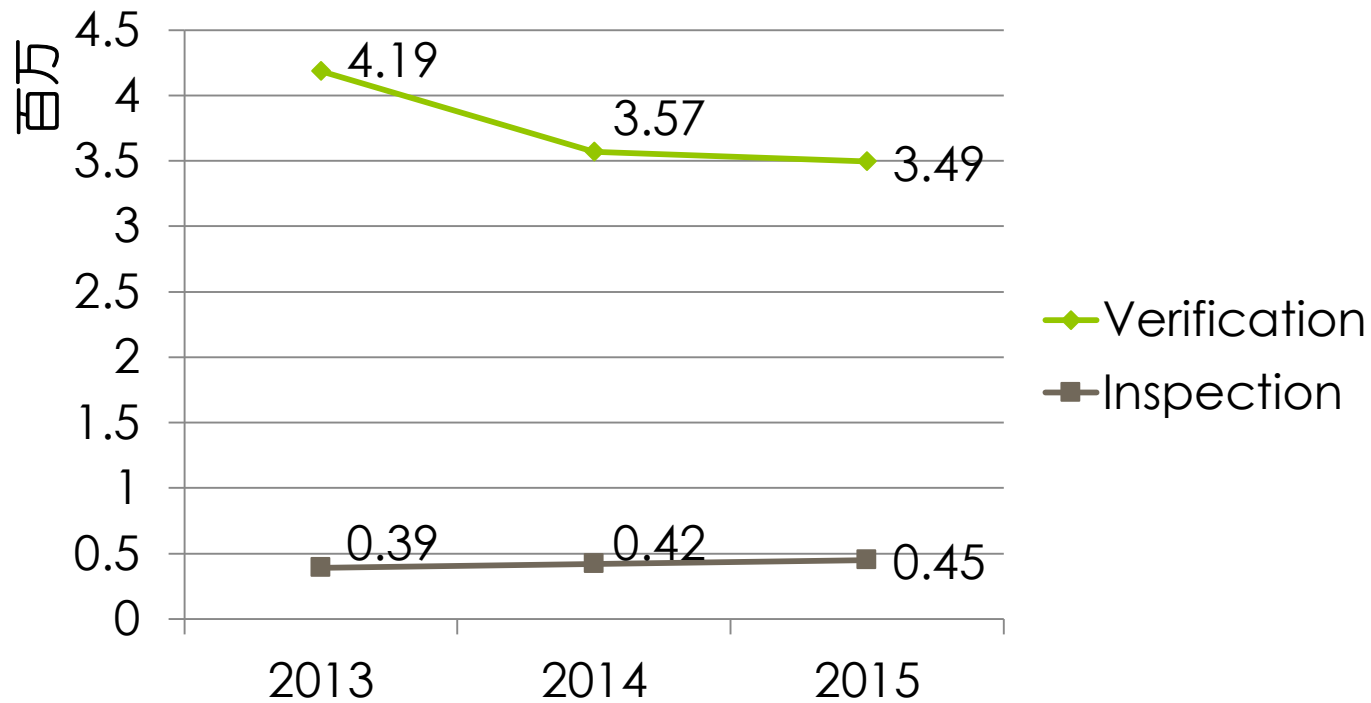
- Weighing, Volume and Measuring instruments
- Weighing and Measuring instruments
- Weighing instruments
- Measuring instruments

Sell

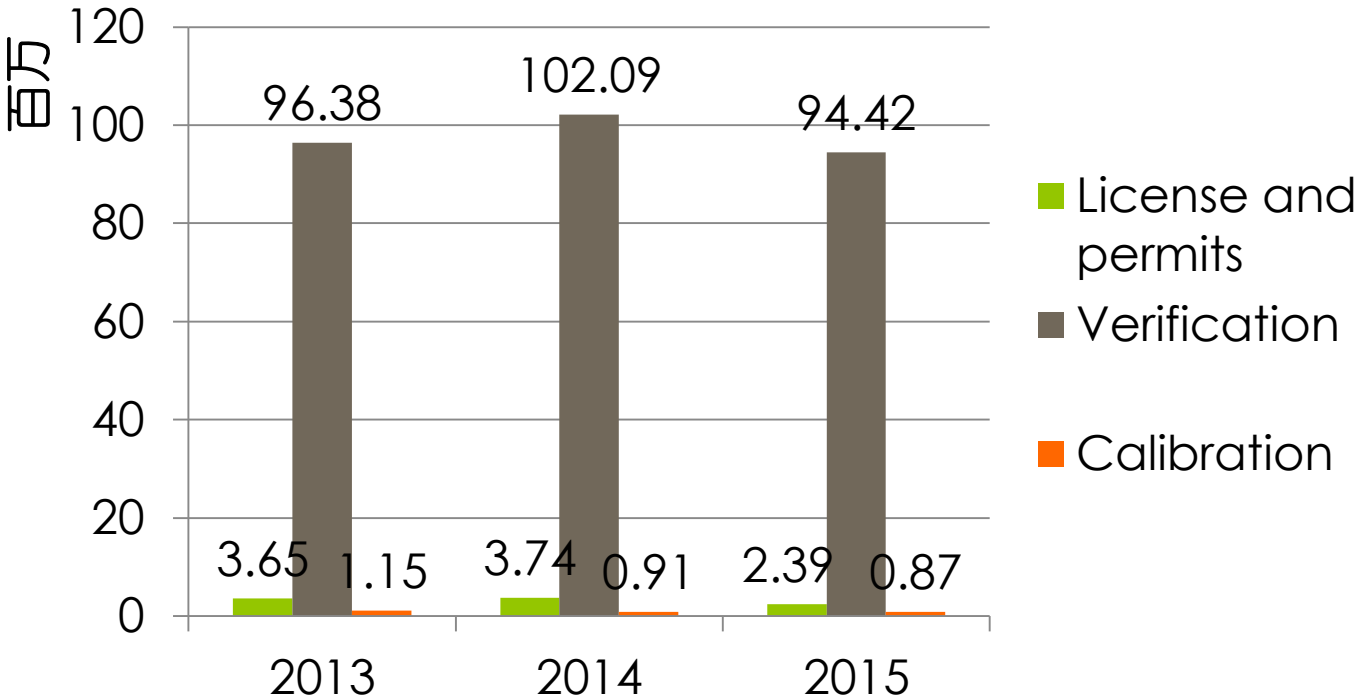


- Weighing and Volume instruments
- Volume and Measuring instruments
- Volume instruments

Verification and Inspection

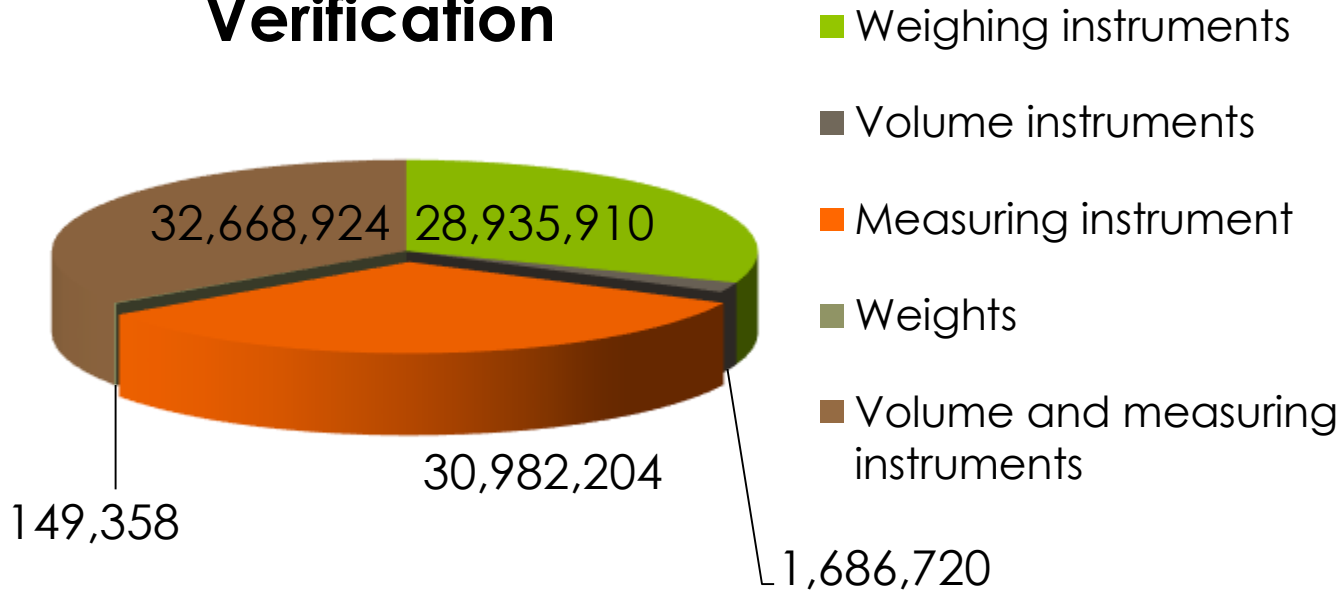


Collected fee

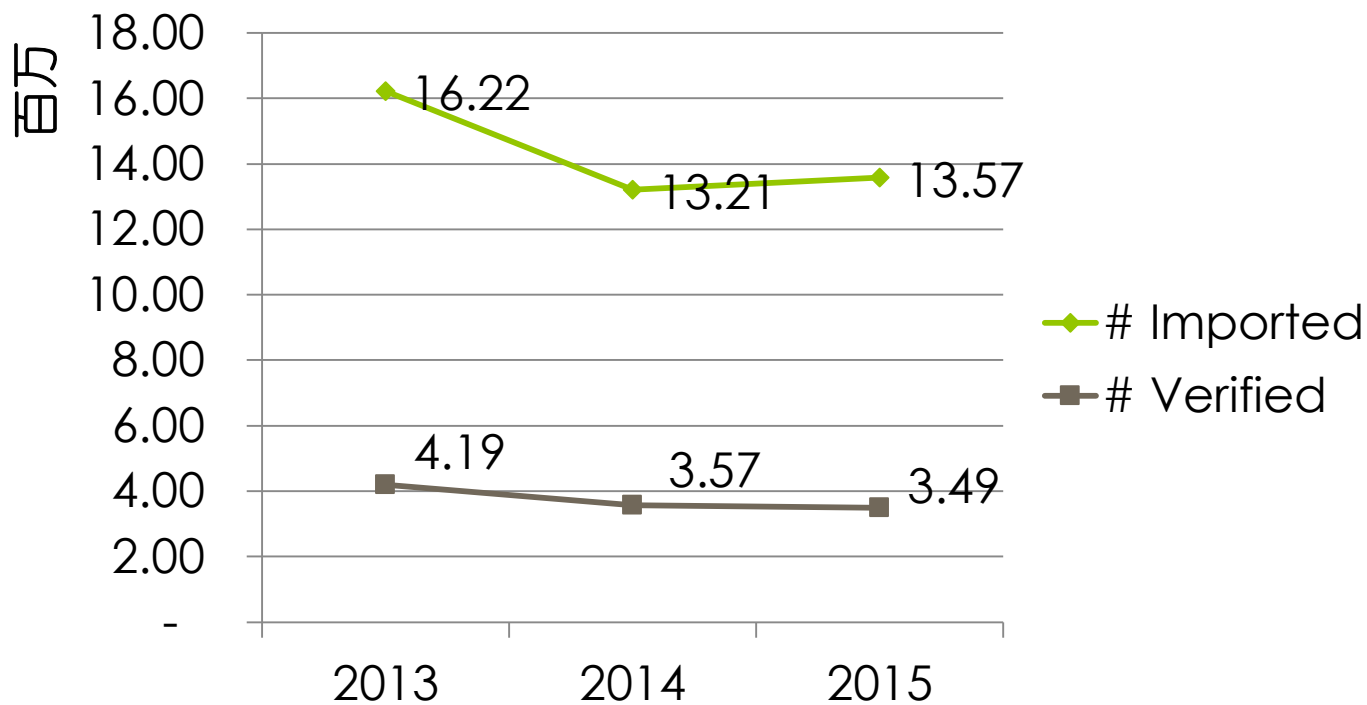


Year 2015 - collected fee

Verification



Number of W&M instruments Imported - Verified



Scope

**Fair
Trade**

*Official
measurement*

*Environmental
Protection*

*Internati
onal*

*Safety at
Work*

*Fiscal
Correctne
ss*

*Health
Protection*



Currently

- **Drafting** ASEAN Guidelines on Type Approval Control
- **Reforming** Legal Metrology Management System
- **Planning** to implement Type Approval System
- **Expanding** regulated Weighing and Measuring instrument



Raising awareness of Metrology



Training course/Seminar topic
needed



Thank you !