



MARINE AIDS TO NAVIGATION STATISTICS

IALA QUESTIONNAIRE 2017



This page intentionally blank

Executive Summary

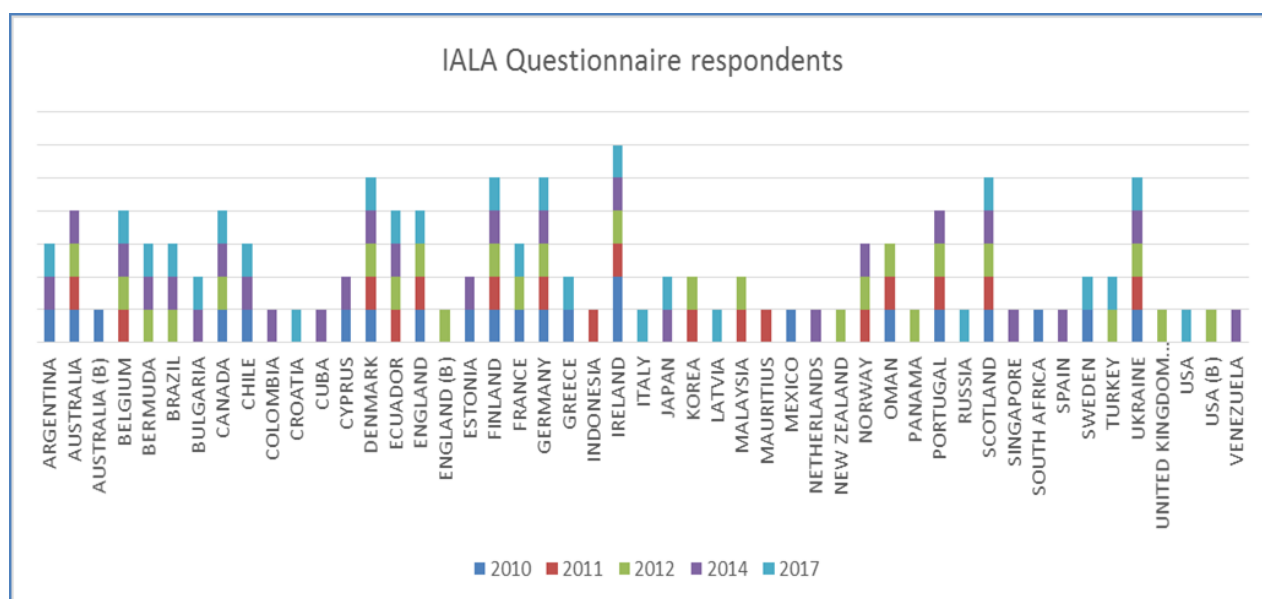
Every four years, IALA carries out a survey to determine trends in the provision of Marine Aids to Navigation. Up until 2014 the survey was carried out annually.

The objective of the survey is to provide statistics on marine aids to navigation for which IALA National Members are responsible. The statistics are based on a general questionnaire which was prepared by the IALA Aids to Navigation Requirements (ARM) Committee and reflects matters of interest to IALA members.

The questionnaire includes sections on organisational responsibility, personnel engaged in AtoN provision, AtoN management of both fixed and floating AtoN, sound signals, radio AtoN, VTS, service delivery, AtoN lights and power supply equipment, and funding.

This report provides statistics and trends up to 2017 using surveys carried out by IALA in 2010, 2011, 2012, 2014, and 2017.

Responses were received from 25 administrations in 2017 representing approximately 30% of IALA National Members. Respondents include both national and regional AtoN providers.



The questionnaire and report provide valuable information on the present status and trends in AtoN provision worldwide.

Table of Contents

1.	Introduction	8
2.	IALA Membership.....	8
3.	Questionnaire Methodology	9
4.	Respondents	10
5.	Organisation Responsibility.....	11
5.1	Organisation responsibility	11
5.2	AtoN category responsibility	11
6.	Quality Management	12
6.1	Quality management tools	12
6.2	Document management	12
7.	Marine Aids to Navigation Staff	13
8.	Fixed Aids to Navigation including Lighthouses	15
8.1	Staffed and automated lighthouses	15
8.2	Number of fixed AtoN	16
8.3	Trends in fixed AtoN	17
8.4	Remote controlled lighthouses	18
8.5	Remotely monitored fixed AtoN	18
8.6	Historic lighthouses	19
8.7	Visitor numbers	19
9.	Floating Aids to Navigation	20
9.1	Lighted floating AtoN	21
9.2	Unlighted floating AtoN	21
9.3	Trends in floating AtoN	22
9.4	Emergency wreck marking buoys (EWMB)	23
9.5	Buoy construction – steel vs plastic	24
9.6	Remote monitoring of floating AtoN	25
10.	Sound Signals	25
11.	Radio Aids to Navigation	27
11.1	Differential GPS	27
11.2	Loran	28
11.3	Automatic Identification System (AIS)	28
11.4	Racons	30
12.	Vessel Traffic Services	31
13.	Service Delivery	33
13.1	Contracting out	33
13.2	Vessels	34

14.	Equipment.....	34
14.1	Types of lights	34
14.2	Traditional optic equipment	35
14.3	LED lanterns	35
14.4	Power systems	36
15.	Finance.....	37
ANNEX A	IALA Questionnaire 2017	2
ANNEX B	Questionnaire respondents 2010-2017.....	6
ANNEX C	AtoN Responsibility by IALA Category	8
ANNEX D	Number of fixed AtoN 2017.....	10
ANNEX E	Number of Floating AtoN 2017.....	11

List of figures

Figure 1	IALA membership 2017	8
Figure 2	IALA membership evolution	9
Figure 3	Industrial members by country 2018	9
Figure 4	IALA Questionnaire respondents 2010-2017	10
Figure 5	Number of respondents vs IALA membership	10
Figure 6	Countries that responded to the 2017 questionnaire	10
Figure 7	Countries that responded to one or more questionnaires 2010 to 2017	11
Figure 8	Organisation management	12
Figure 9	Document management certification by country	13
Figure 10	AtoN personnel 2017	14
Figure 11	Average number of personnel per country engaged in AtoN provision	15
Figure 12	Average number of personnel engaged in AtoN provision per lighthouse	15
Figure 13	Percentage staffed and automated lighthouses	16
Figure 14	Number of fixed AtoN per country 2017	16
Figure 15	Distribution of fixed AtoN types 2017	17
Figure 16	Distribution of fixed AtoN by year	17
Figure 17	Trends in fixed AtoN 2010 to 2017	17
Figure 18	Remote controlled lighthouses	18
Figure 19	Percentage of fixed AtoN monitored	18
Figure 20	Historic lights and alternative use	19
Figure 21	Trends for historic lighthouses and alternative use	19
Figure 22	Number of visitors to alternatively used lighthouses	20
Figure 23	Distribution of floating AtoN 2017	20
Figure 24	Number of lighted floating AtoN excluding spar buoys 2017	21
Figure 25	Distribution of fixed AtoN per country by proportion	21
Figure 26	Proportion of unlighted buoys per country 2017	22
Figure 27	Percentage distribution of floating AtoN by AtoN type 2010 to 2017	22
Figure 28	Percentage distribution of floating AtoN by year	23
Figure 29	Emergency wreck marking buoys deployed in 2017	23

Figure 30	Proportion of steel and plastic buoys 2017	24
Figure 31	Proportion of steel and plastic buoys per country 2017	24
Figure 32	Percentage of floating AtoN with remote monitoring	25
Figure 33	Percentage of all buoys (excluding spar buoys) fitted with sound signals (bells, gongs, whistles) 2010 to 2017	26
Figure 34	Percentage of all buoys (excluding spar buoys) fitted with bells, gongs, whistles	26
Figure 35	Percentage of lighthouses with fog horns 2010 to 2017	27
Figure 36	Number of DGPS stations reported in 2017	27
Figure 37	DGPS service worldwide based on 2010 to 2017 questionnaires	27
Figure 38	Number of DGPS stations reported by year	28
Figure 39	Loran service based on 2010 to 2017 questionnaires	28
Figure 40	Number of Loran stations reported from 2010 to 2017	28
Figure 41	Deployment of AIS AtoN reported in 2017	29
Figure 42	Method to AIS AtoN deployment 2017	29
Figure 43	Deployment of AIS AtoN (base station, fixed station AtoN, buoys AtoN, Virtual AIS AtoN) 2010 to 2017	29
Figure 44	Annual number of AIS AtoN	30
Figure 45	Annual distribution of methods of AIS AtoN provision 2010 to 2017	30
Figure 46	Racon provision 2017	30
Figure 47	Racon provision on fixed AtoN and buoys 2010 to 2017	31
Figure 48	VTs management by country 2017	31
Figure 49	VTs infrastructure 2017	31
Figure 50	Number of ship reporting systems by country 2017	32
Figure 51	Number of accredited VTs training centres by country 2017	32
Figure 52	Countries reporting VTs management arrangements 2010 to 2017	32
Figure 53	Percentage use of contracting out by country 2017	33
Figure 54	Countries using contracting out for some or all AtoN 2010 to 2017	33
Figure 55	Vessel provision by country 2017	34
Figure 56	Types of lights by country 2017	34
Figure 57	Types of lights 2010 to 2017	35
Figure 58	Use and type of traditional optic equipment 2017	35
Figure 59	Percentage of LED lanterns by country 2017	35
Figure 60	Power systems by country 2017	36
Figure 61	Trends in power systems 2017	36
Figure 62	Respondents charging a levy on shipping 2010 to 2017	37
Figure 63	Countries charging a levy on shipping 2010 to 2017	37
Figure 64	Shipping levy policy by user type per country 2010 to 2017	37
Figure 65	Organisations that impose a commercial shipping levy by country 2010 to 2017	38
Figure 66	Organisations that impose a fishing shipping levy by country 2010 to 2017	38
Figure 67	Figure 61 Organisations that impose a leisure shipping levy by country 2010 to 2017	39
Figure 68	Funding of AtoN organisations	39

List of tables

Table 1	Summary of quality management tools used by respondents	12
Table 2	Summary of document management certification	12
Table 3	Other document management systems	13
Table 4	Total number of personnel engaged in AtoN provision	14
Table 5	Average number of personnel per country engaged in AtoN provision	14
Table 6	Number of sound signals 2017	25

Report on analysis of the IALA Questionnaire 2017

1. INTRODUCTION

Every four years, IALA carries out a survey to determine trends in the provision of Marine Aids to Navigation. Up until 2014 the survey was carried out annually.

The objective of the survey is to provide statistics on marine aids to navigation for which IALA National Members are responsible. The statistics are based on a general questionnaire which was prepared by the IALA Aids to Navigation Requirements (ARM) Committee and reflects matters of interest to IALA members.

This report provides statistics and trends up to 2017 using surveys carried out by IALA in 2010, 2011, 2012, 2014, 2017.

2. IALA MEMBERSHIP

IALA membership is summarised in the following figures.

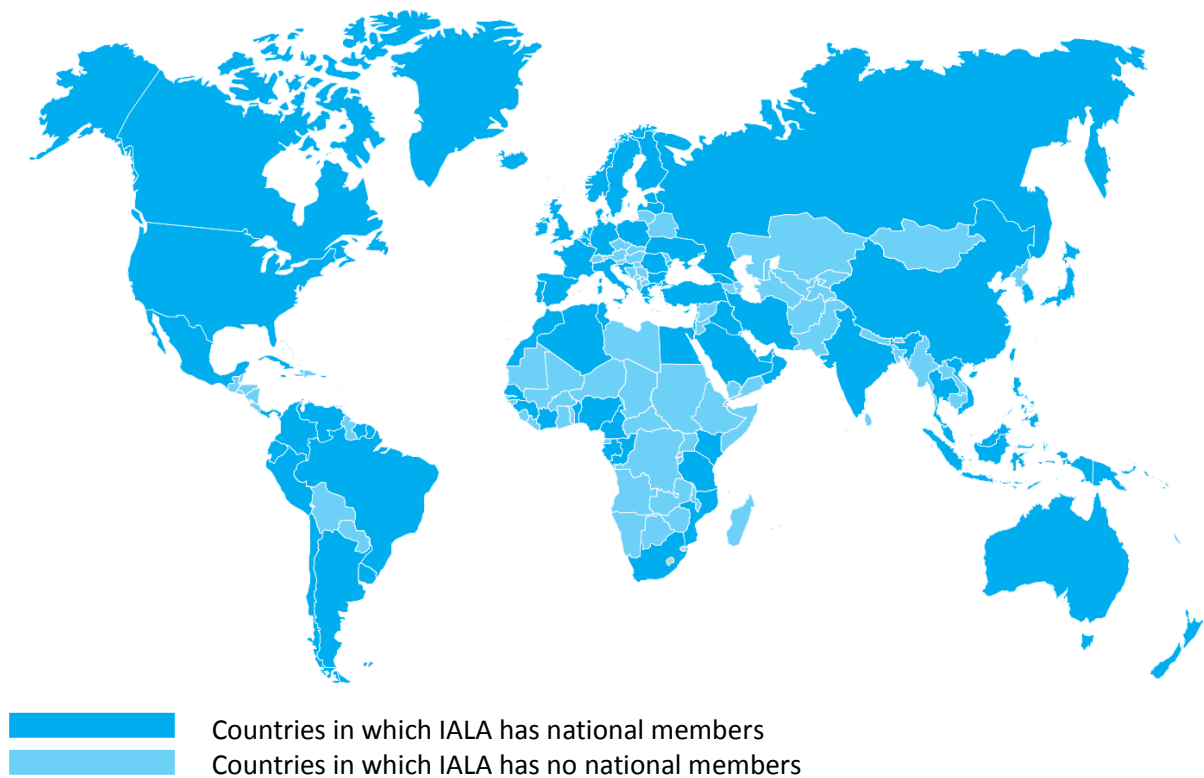


Figure 1 IALA membership 2017

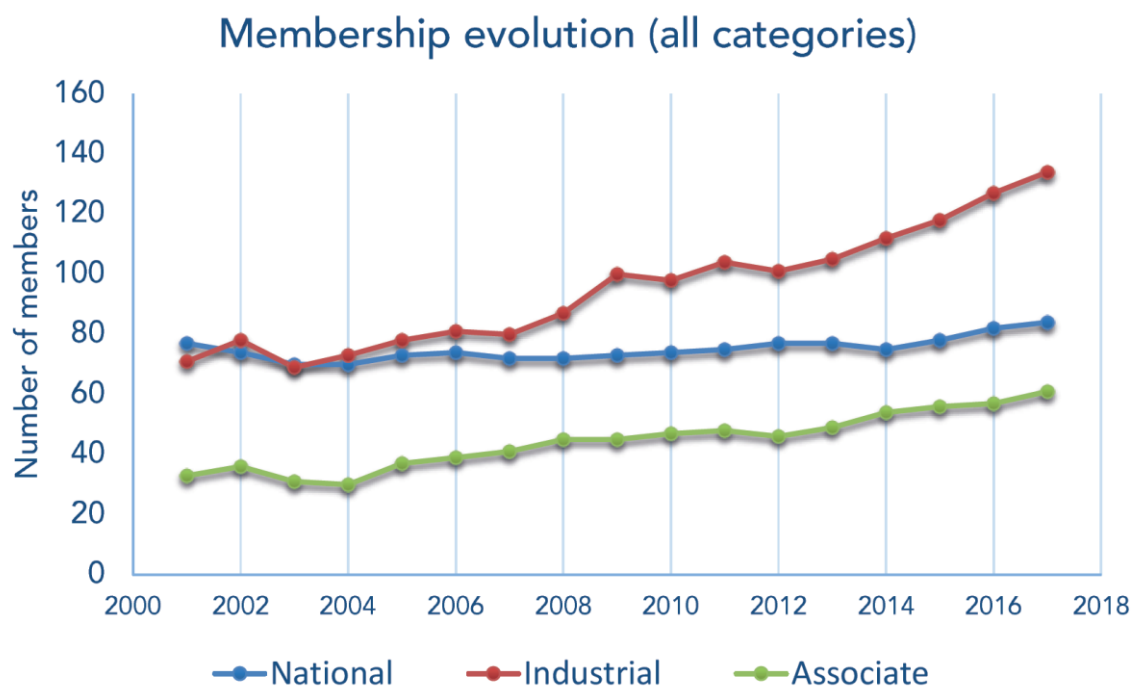


Figure 2 IALA membership evolution

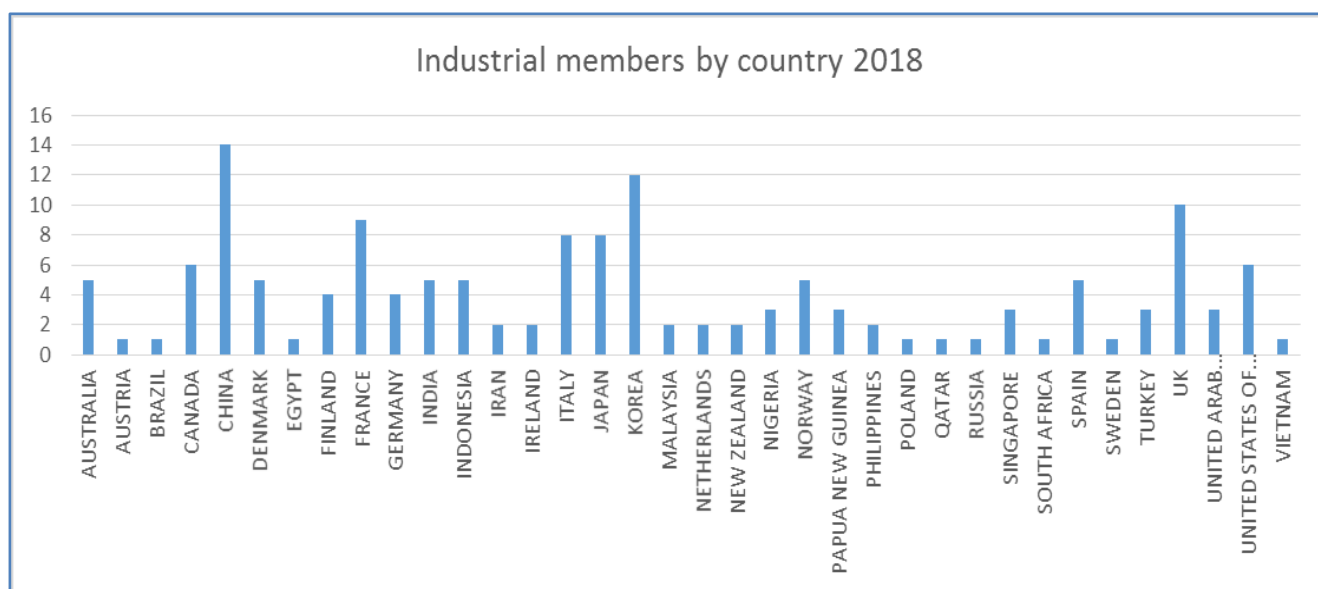


Figure 3 Industrial members by country 2018

3. QUESTIONNAIRE METHODOLOGY

In 2017 a questionnaire in MS Excel spreadsheet format was distributed to all IALA National Members. The responses were summarised into an Excel spreadsheet database structure and combined with the responses from the questionnaires in 2010, 2011, 2012, 2014. Excel tools were used to analyse and present the data.

In order to normalise the data to show trends average and percentage summaries have been used as detailed in the report sections below.

4. RESPONDENTS

Responses were received from 25 administrations in 2017. Respondents to all surveys from 2010 to 2017 are shown in Figure 4. Respondents include both national and regional AtoN providers. A full list of respondents is shown in ANNEX B.

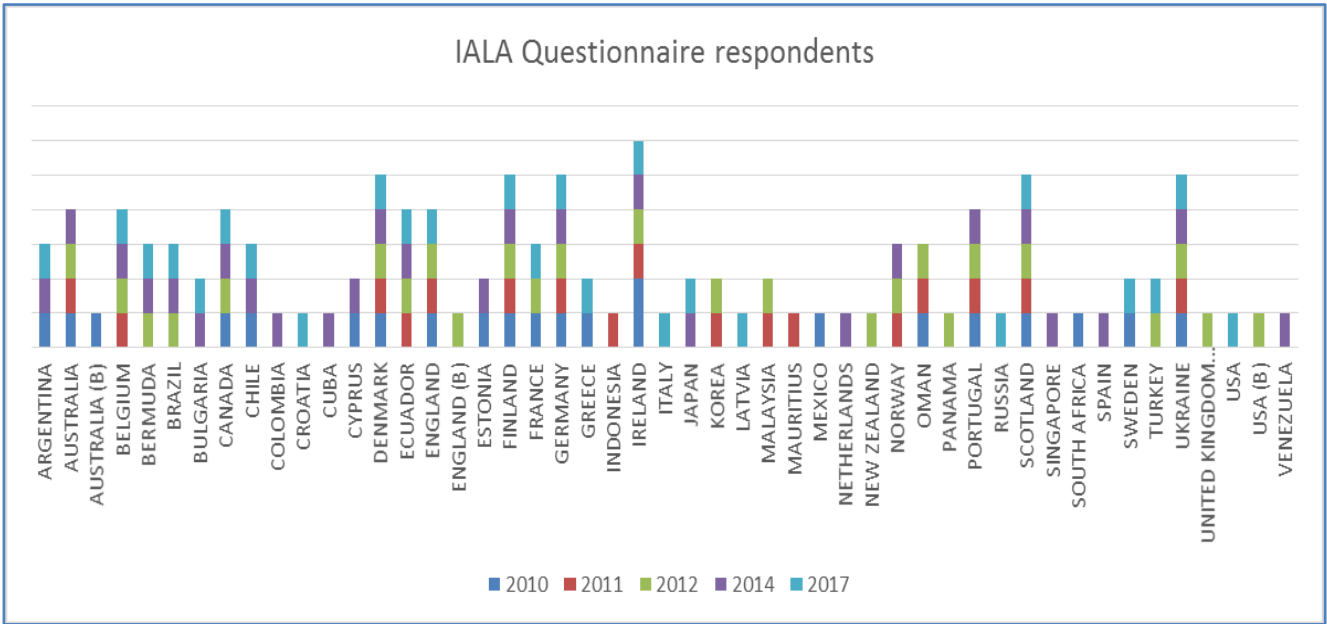


Figure 4 IALA Questionnaire respondents 2010-2017

The number of respondents per year is shown in Figure 5. Approximately 30% of IALA National Members respond to each questionnaire.

Figure 5 Number of respondents vs IALA membership

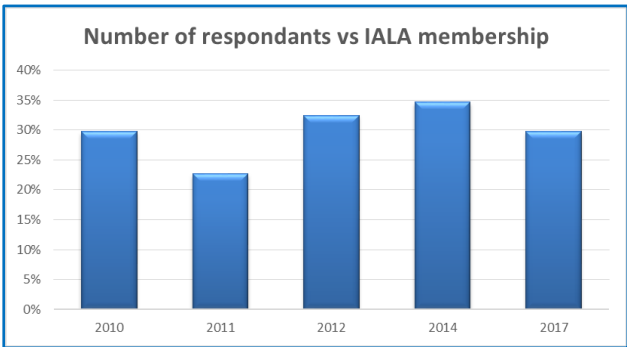
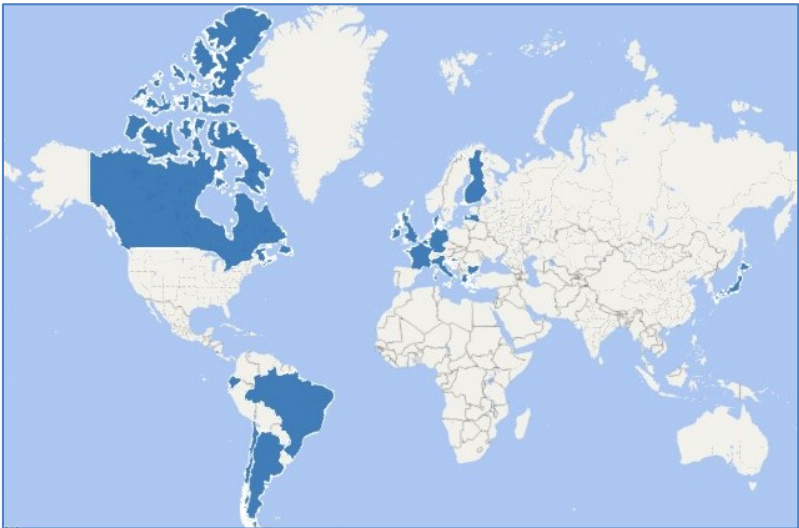
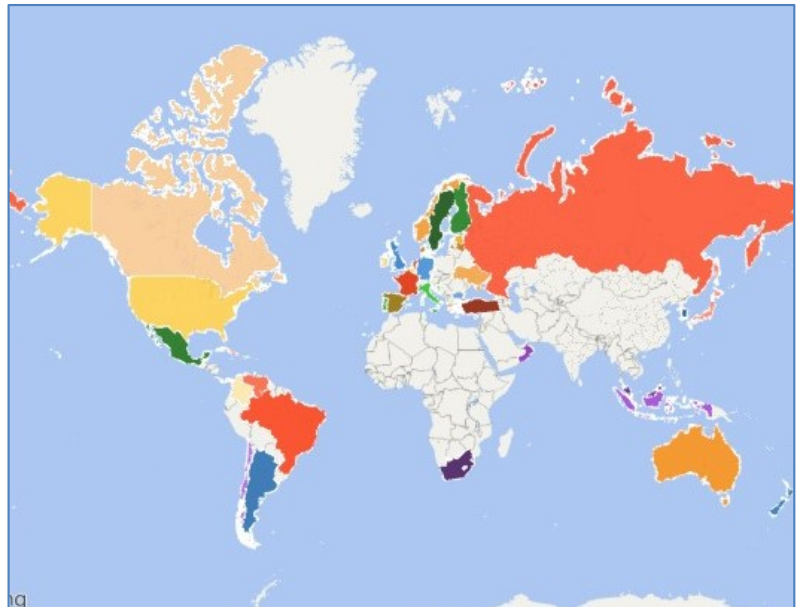


Figure 6 Countries that responded to the 2017 questionnaire



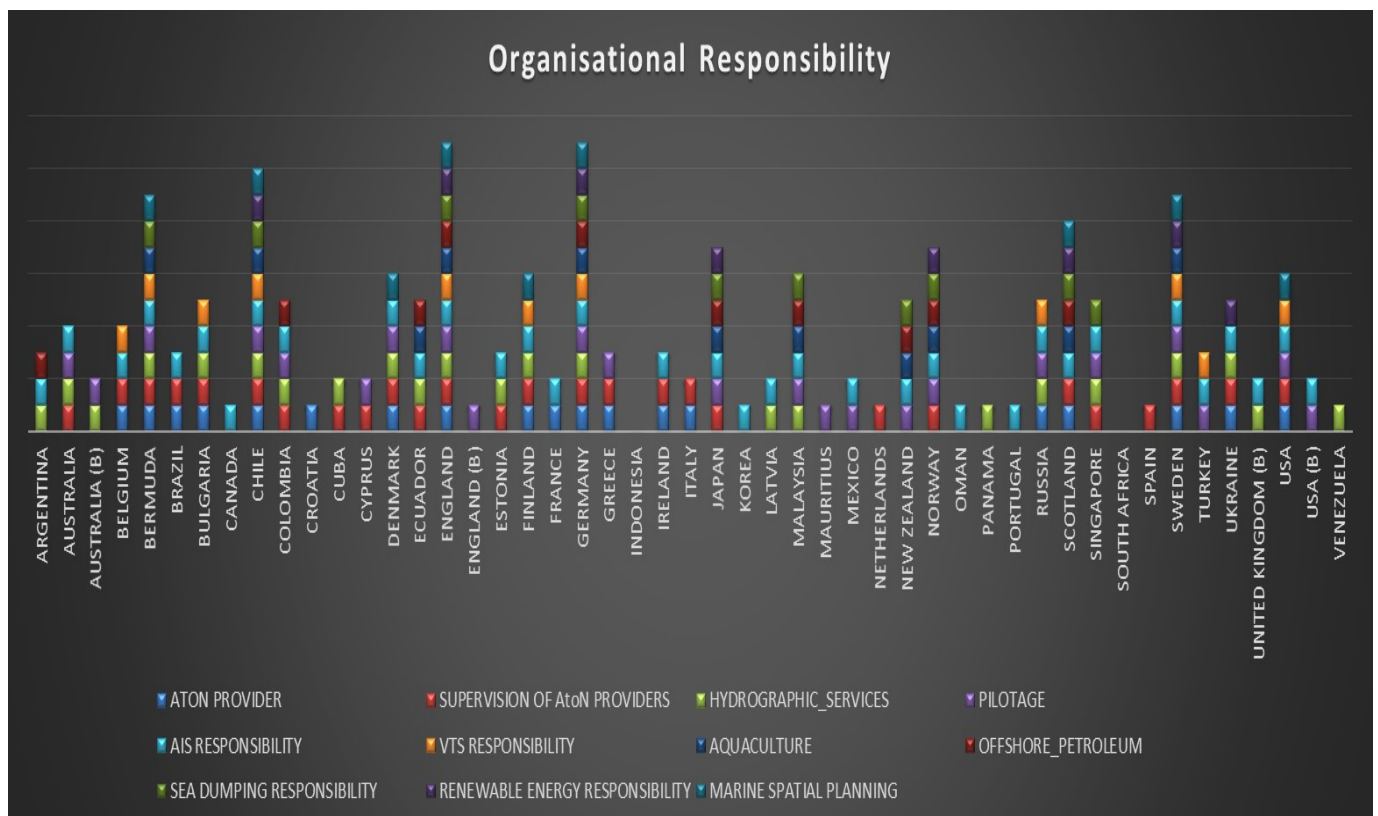
Over the period 2010 to 2017 46 countries responded, representing 55% of IALA National Members in 2017.

Figure 7 Countries that responded to one or more questionnaires 2010 to 2017



5. ORGANISATION RESPONSIBILITY

5.1 Organisation responsibility



5.2 AtoN category responsibility

Questions regarding responsibility for different categories of AtoN was first asked in 2014. Hence data was available for this review from 2014 and 2017. Data from 2017 was used where available while data from 2014 was used for those respondents who did not respond in 2017.

Respondents were requested to provide the number of AtoN in the three IALA AtoN Categories for which they were directly responsible and for the total number of AtoN nationally. The results are tabulated in ANNEX C.

6. QUALITY MANAGEMENT

6.1 Quality management tools

Based on the surveys from 2010 to 2017, the number of respondents using quality management tools is shown in Table 1. Use of performance indicators, risk management tools and training facilities is shown in Figure 8.

Table 1 Summary of quality management tools used by respondents

	Total	%
Performance Indicators	44	90%
Risk Management	35	71%
Training facility	38	78%



Figure 8 Organisation management

6.2 Document management

Based on the surveys from 2010 to 2017, 67% of respondents reported that they use some form of document management system. Table 2 shows the breakdown. 24% reported that they use both ISO and other document management systems.

Table 2 Summary of document management certification

	Total	%
ISO certification	26	53%
Other certification	19	39%
Certification to some standard	33	67%

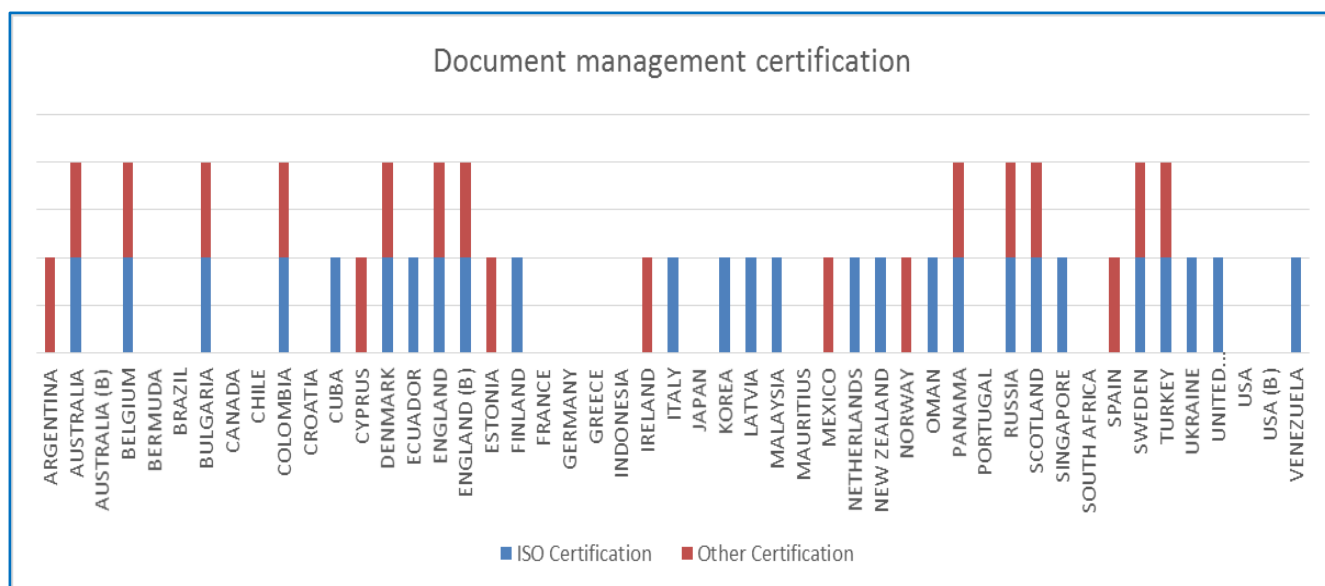


Figure 9 Document management certification by country

Other document management systems reported are shown in Table 3.

Table 3 Other document management systems

Ecoports Certification
EFQM
EFQM
ISM
ISO 14001
ISO 9001 /14001 / ROSPA LEVEL 5
ISO EN TRAMITE DE RENOVACION
ISO9001, ISO14001, AS/NZS4801
Non certified quality management system
NTCGP 1000 E 150
QM is based on ISO 9001 but not certified
ROSPA (Safety)
Service Quality System (AENOR)

7. MARINE AIDS TO NAVIGATION STAFF

Personnel involved in AtoN provision is divided into four groups – office staff, district depots, lighthouses/ lightkeepers, ships/vessels/maintenance. 2017 was the first year with the question on ships/vessels/maintenance so there is no trend for this category.

The number of personnel engaged in AtoN provision in 2017 is shown in Figure 10.

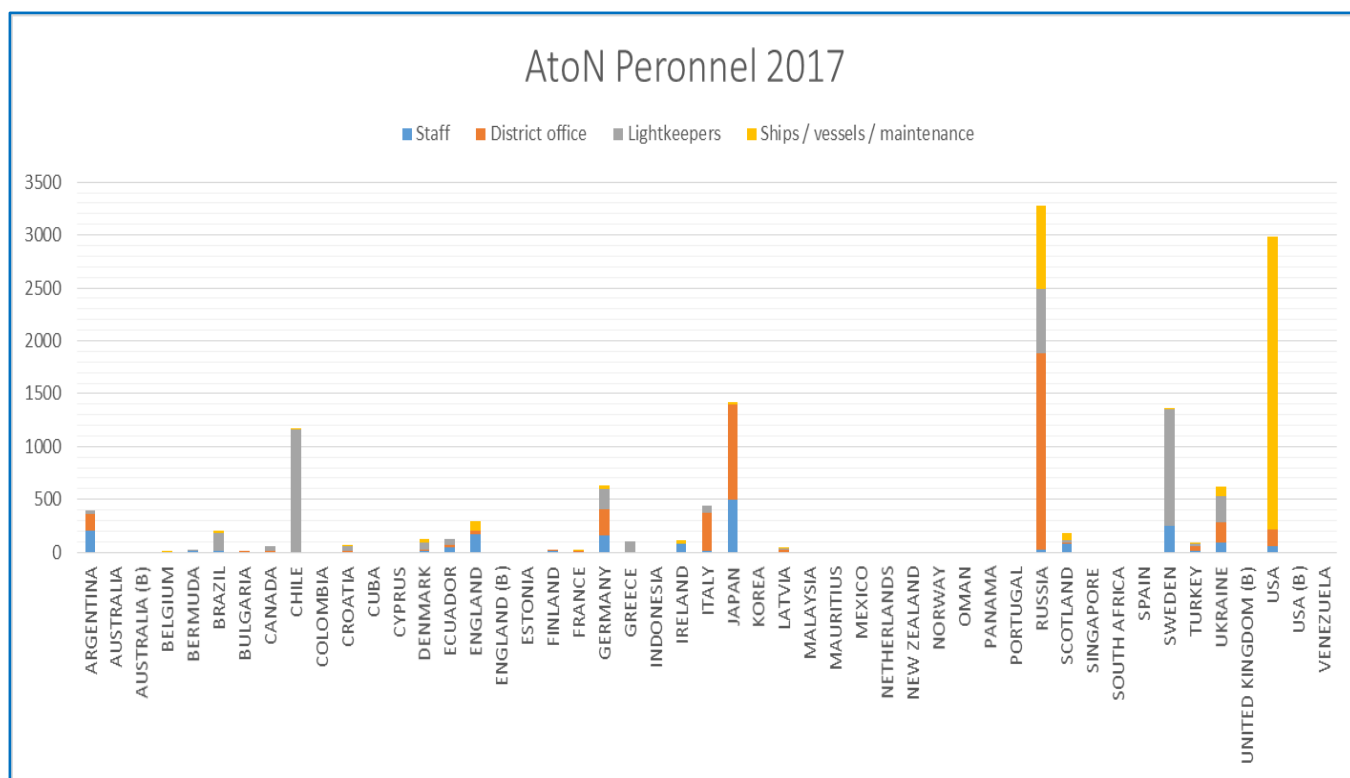


Figure 10 AtoN personnel 2017

The total number of personnel engaged in AtoN provision over the years 2010 to 2017 is shown in Table 4. Since different administrations with different staffing arrangements and significantly varying numbers of employees respond each year it is difficult to establish a trend from the absolute numbers.

Table 4 Total number of personnel engaged in AtoN provision

	2010	2011	2012	2014	2017
Staff	3731	2567	7892	1761	1755
District Depot	106	5458	590	3197	4047
Lightkeepers	968	1604	738	857	3986
Ship/ vessel / maintenance					3984
Total excl ship/ maintenance	4805	9629	9220	5815	9788

The personnel numbers are normalised into the average number of personnel per country in Table 5 to provide a view of trends. The differing numbers of AtoN provided by respondents skew the results somewhat.

Table 5 Average number of personnel per country engaged in AtoN provision

	2010	2011	2012	2014	2017
Staff	170	151	316	68	70
District Depot	5	321	24	123	162
Lightkeepers	44	94	30	33	159
Ship / vessel / maintenance					159
Total per country excl ship/ maintenance	218	566	369	224	392

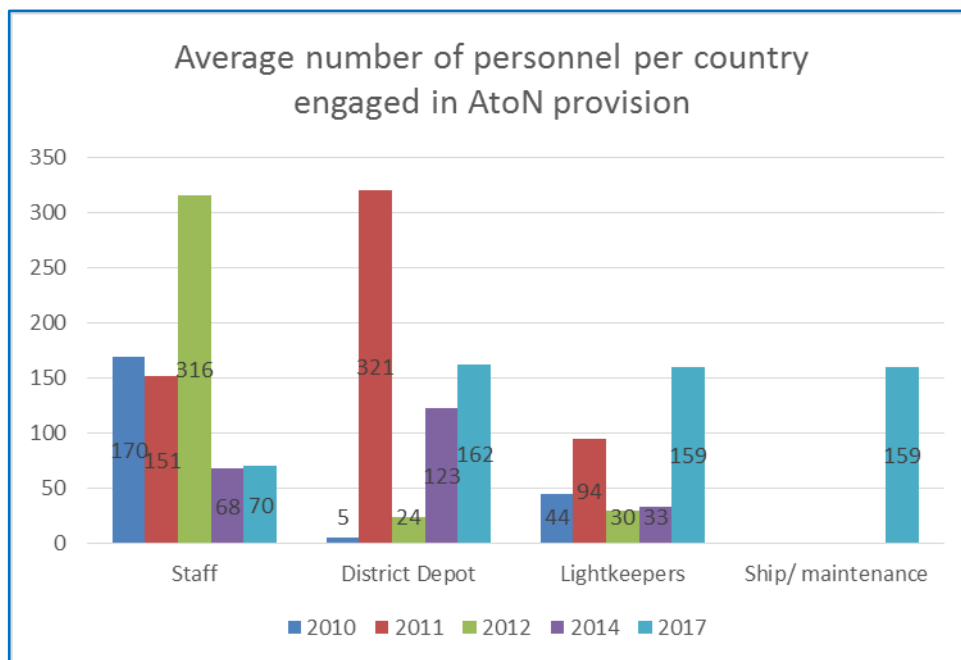


Figure 11 Average number of personnel per country engaged in AtoN provision

The personnel numbers are normalised into the average number of personnel per lighthouse in Figure 12 to provide an alternative view of trends. This is probably the most reliable indicator of manning trends but is still subject to the individual respondents in any given year.

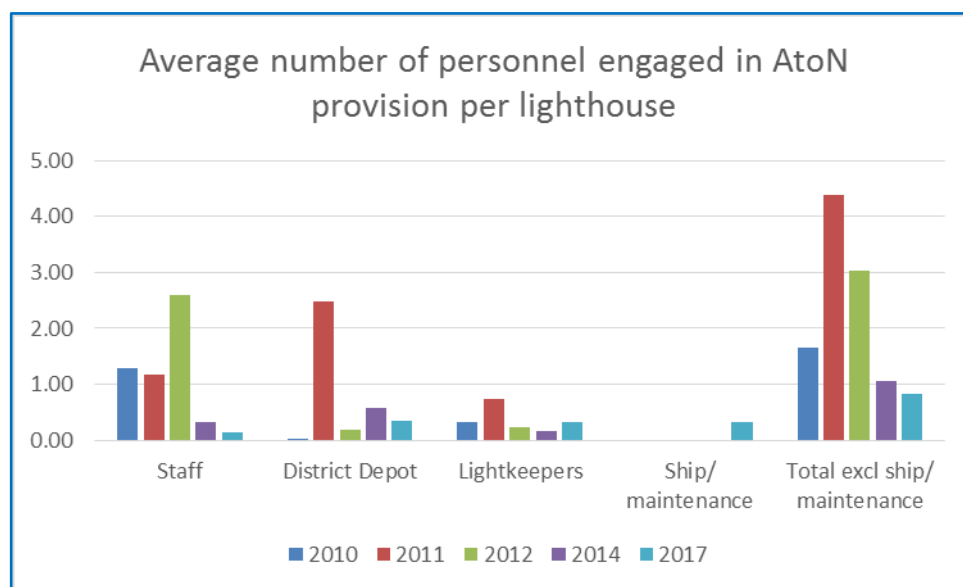


Figure 12 Average number of personnel engaged in AtoN provision per lighthouse

8. FIXED AIDS TO NAVIGATION INCLUDING LIGHTHOUSES

8.1 Staffed and automated lighthouses

Where available, the number of lighthouses was taken from the 2017 responses. Where 2017 data was not available, the most recent data from each respondent was taken back to 2010.

Overall 93% of lighthouses are reported to be automated.

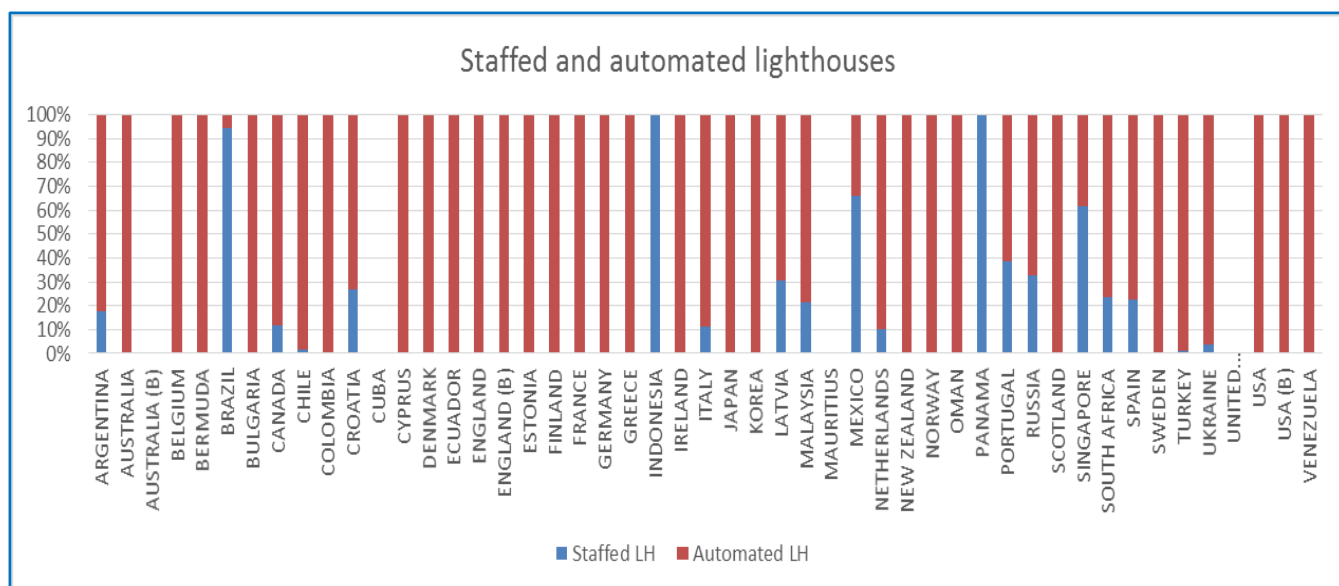


Figure 13 Percentage staffed and automated lighthouses

8.2 Number of fixed AtoN

The number of fixed AtoN reported in 2017 is shown in Figure 14. The numerical values are shown in ANNEX D. Fixed AtoN are categorised as follows:

- Major lights (nominal range of 10 NM or over);
- Minor lights (nominal range under 10 NM);
- Unlit fixed aids (daymarks only);
- Leading lines: (Sector lights, Lit ranges, Unlit ranges).

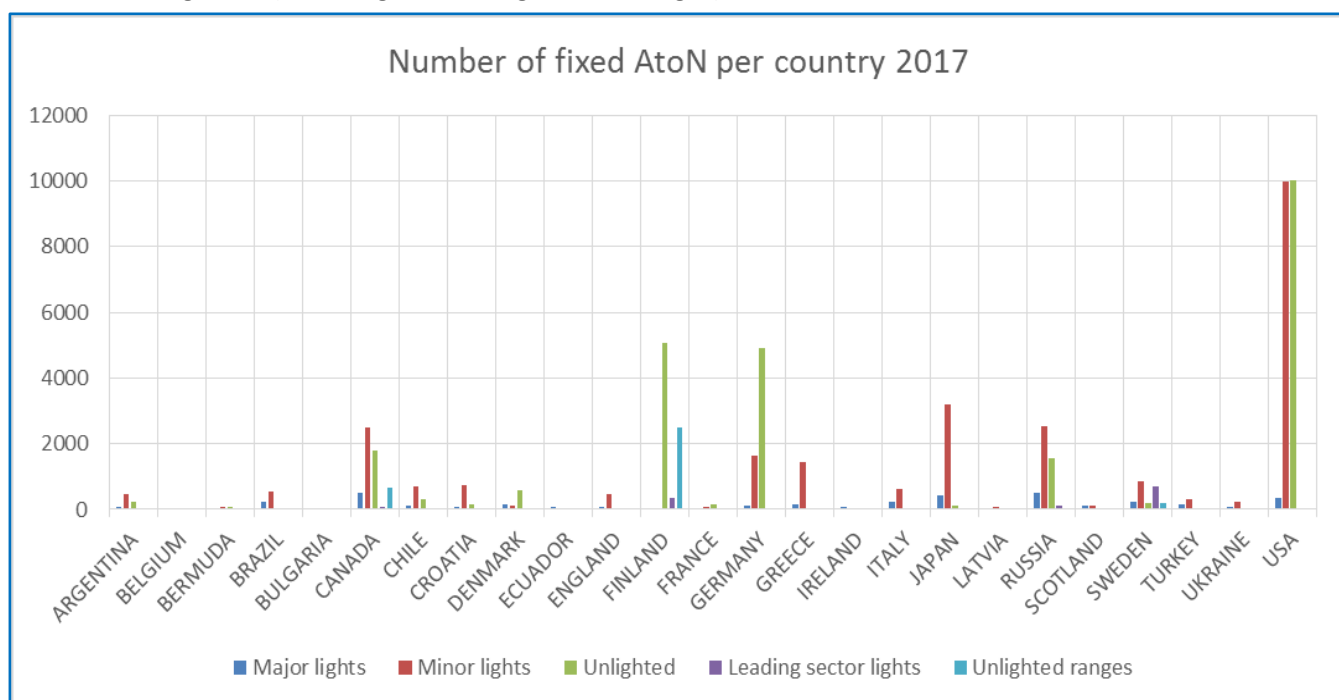


Figure 14 Number of fixed AtoN per country 2017

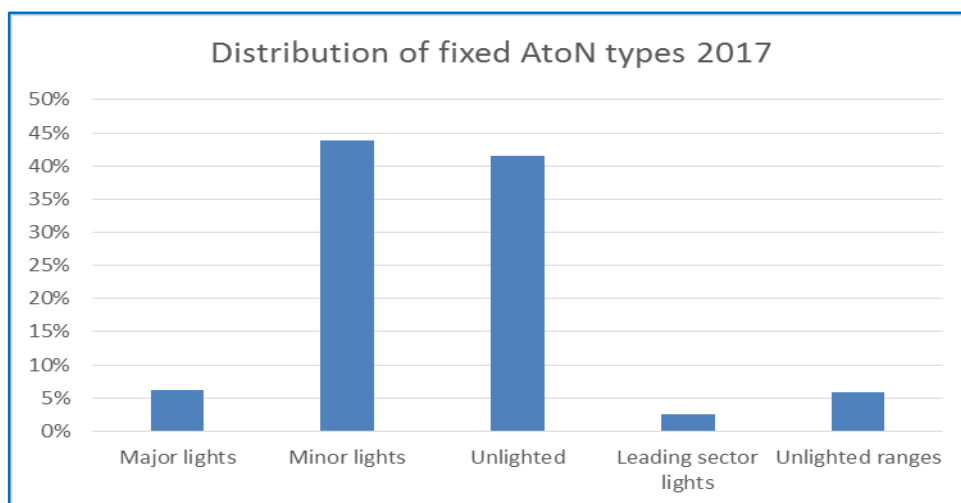


Figure 15 Distribution of fixed AtoN types 2017

8.3 Trends in fixed AtoN

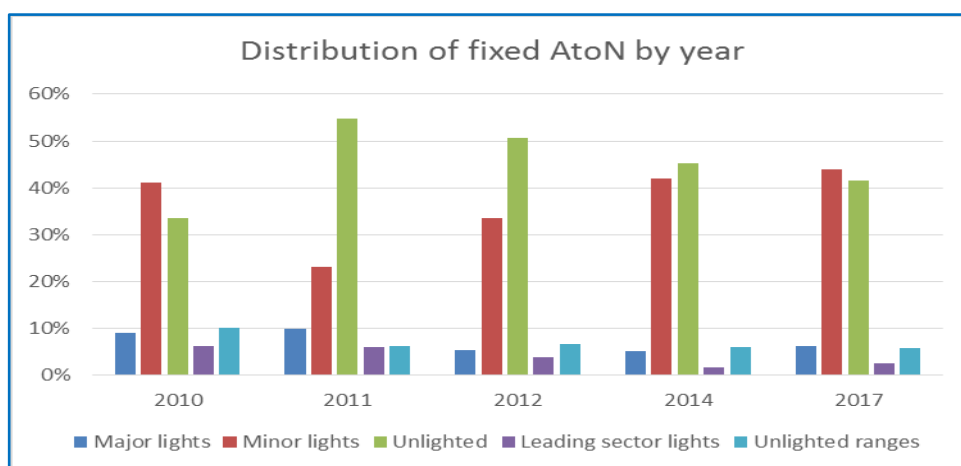


Figure 16 Distribution of fixed AtoN by year

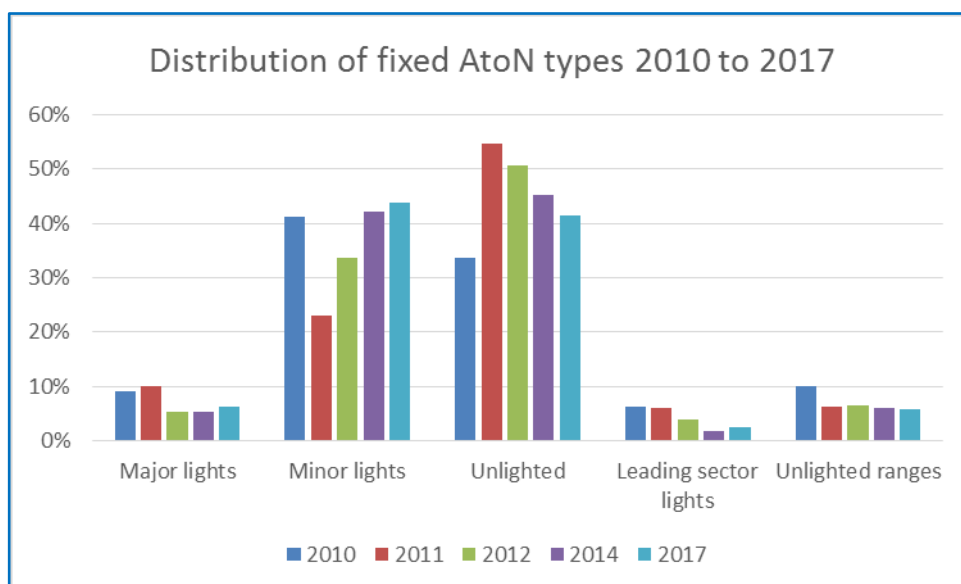


Figure 17 Trends in fixed AtoN 2010 to 2017

8.4 Remote controlled lighthouses

In general 12% of lighthouses are reported to be remotely controlled. A distinction is made between remote control and remote monitoring and the question only addresses remote control. The use of remote control as reported by all respondents from 2010 to 2017 is shown in Figure 18.

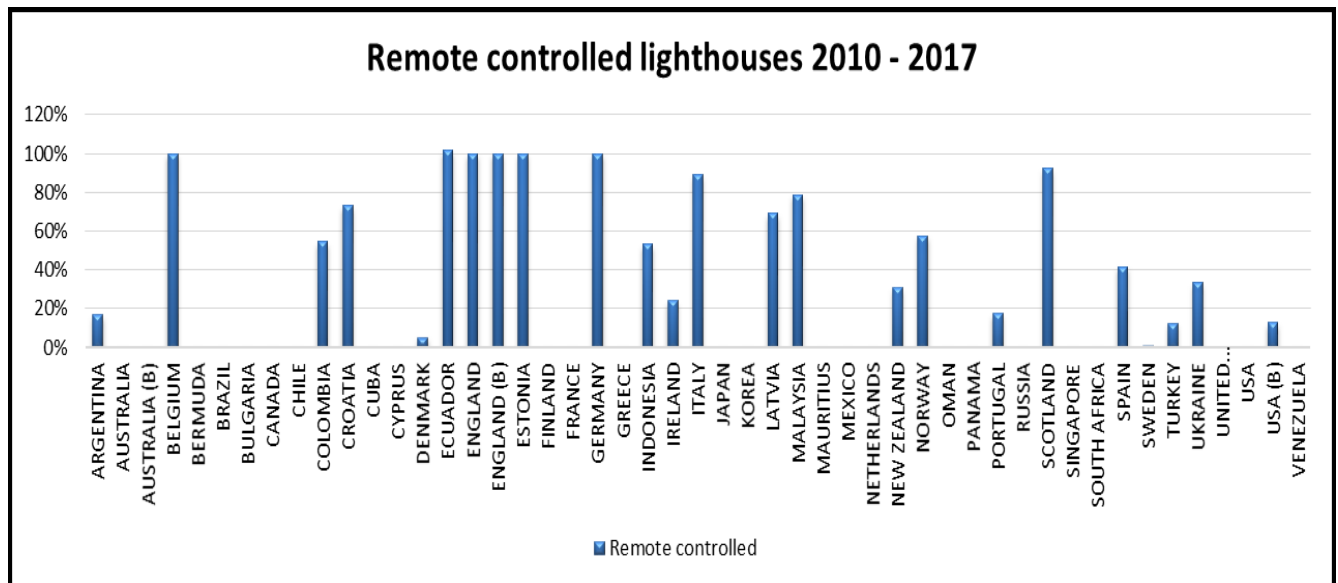


Figure 18 Remote controlled lighthouses

8.5 Remotely monitored fixed AtoN

In 2017 respondents reported monitoring of fixed AtoN as follows.

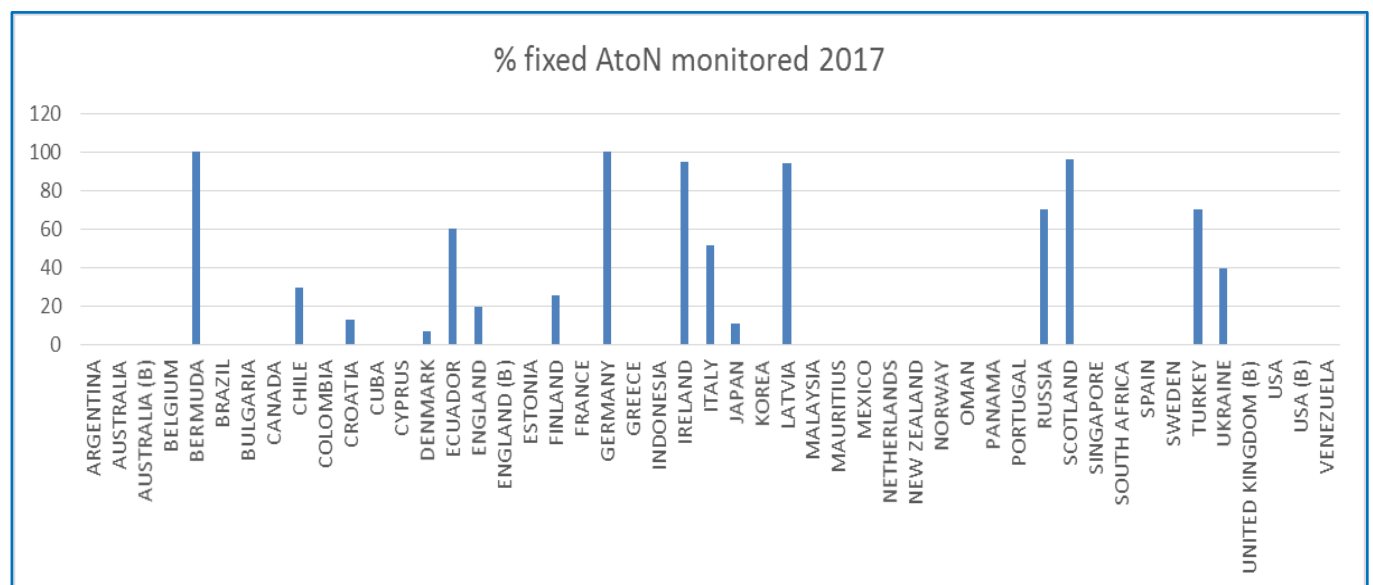


Figure 19 Percentage of fixed AtoN monitored

8.6 Historic lighthouses

Historic lighthouses are those with legal protection as historic monuments.

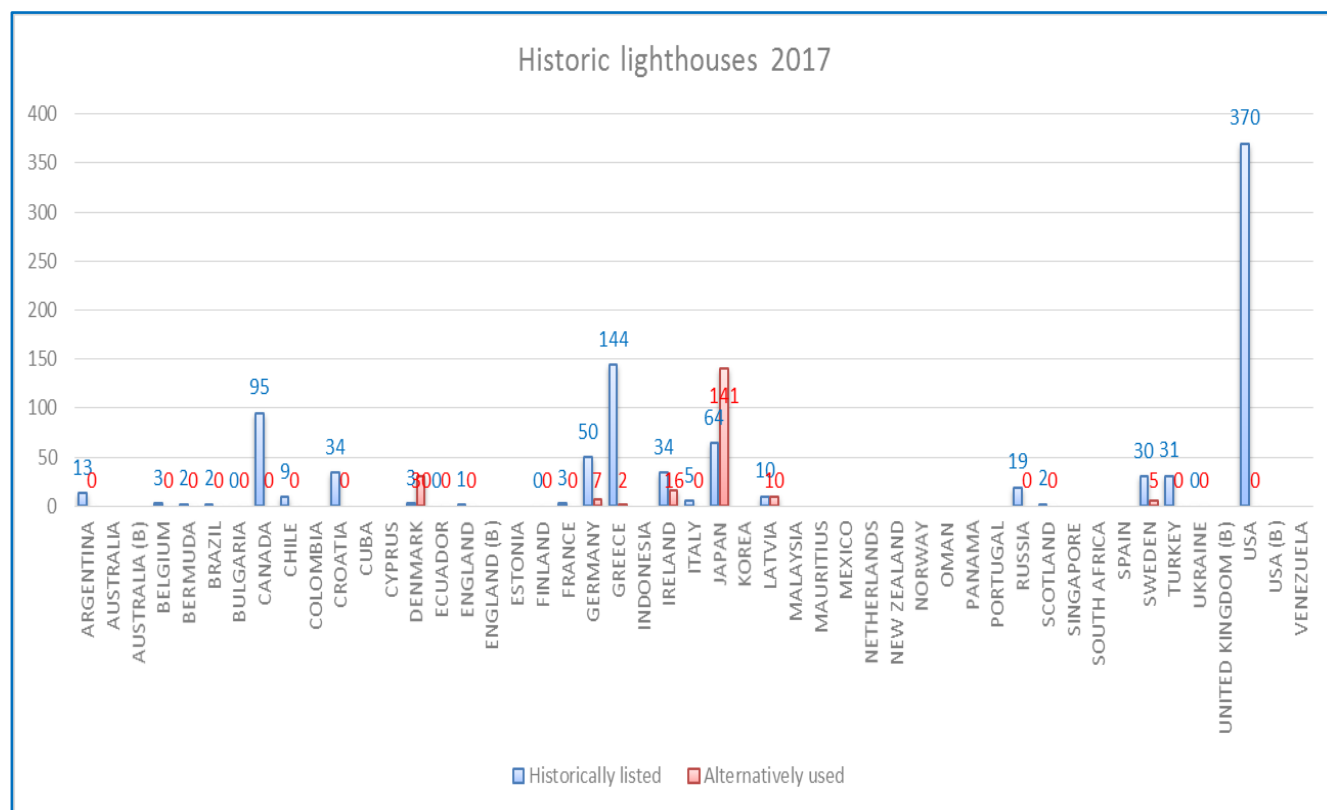


Figure 20 Historic lights and alternative use

Trends for historic lighthouses and alternative use from responses 2010 to 2017 are as follows.

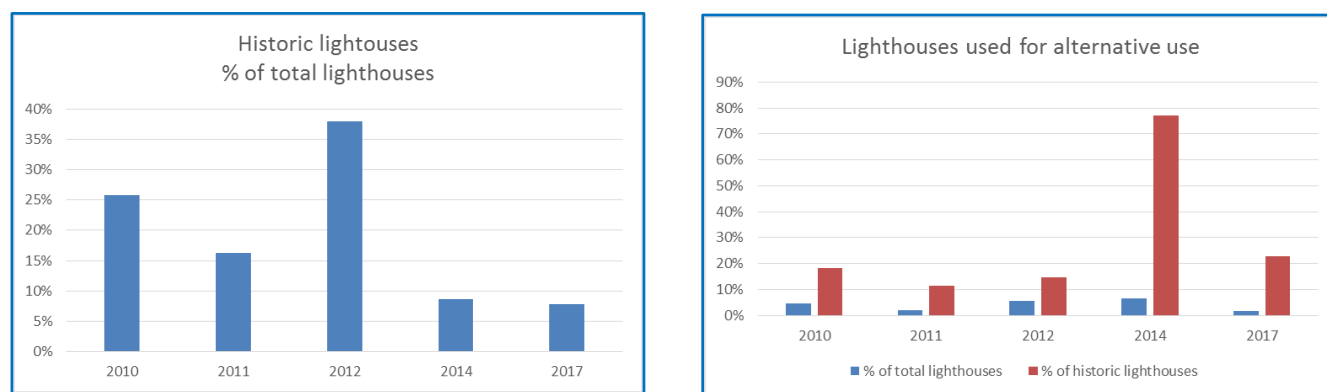


Figure 21 Trends for historic lighthouses and alternative use

8.7 Visitor numbers

Visitor numbers to alternatively used lighthouses was reported in 2014 and 2017. Visitor numbers per alternatively used lighthouses were reported as follows.

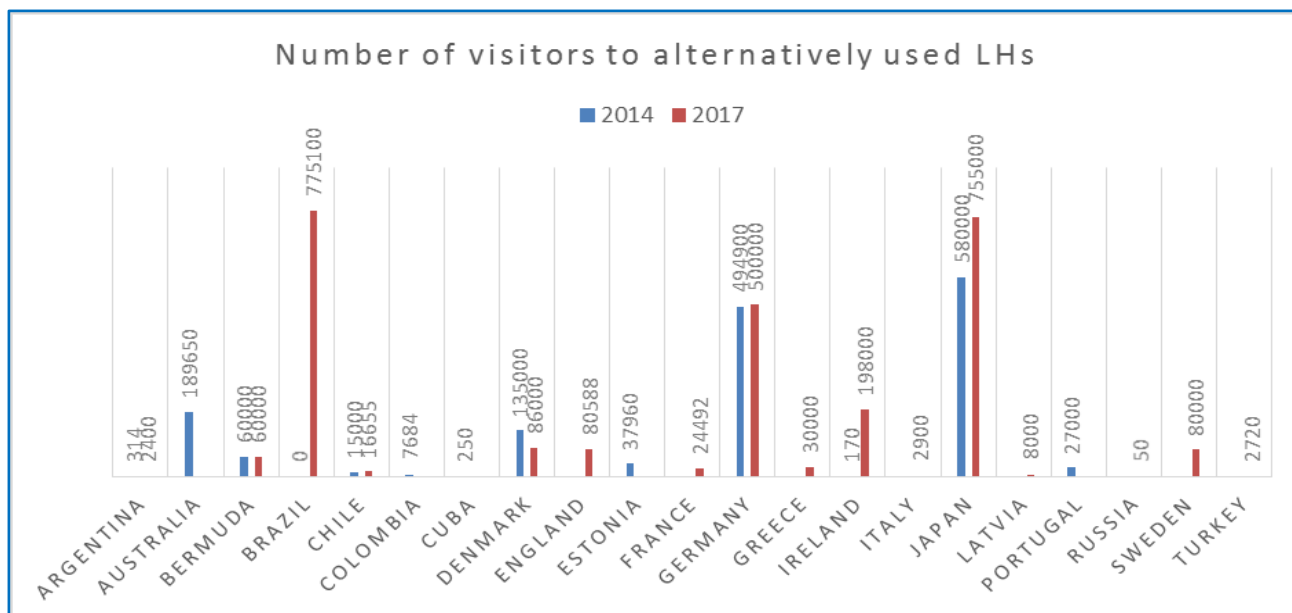


Figure 22 Number of visitors to alternatively used lighthouses

9. FLOATING AIDS TO NAVIGATION

Consideration of floating AtoN is divided into lighted and unlighted with spar buoys considered separately. A full list of floating AtoN reported in 2017 is shown in ANNEX E. Floating AtoN are classified as follows.

- Major lighted (3m diameter or greater)
- Major unlighted (3m diameter or greater)
- Medium lighted (1.5-3m diameter)
- Medium unlighted (1.5-3m diameter)
- Smaller lighted (less than 1.5m diameter)
- Smaller unlighted (less than 1.5m diameter)
- Spar buoys
- Light vessels

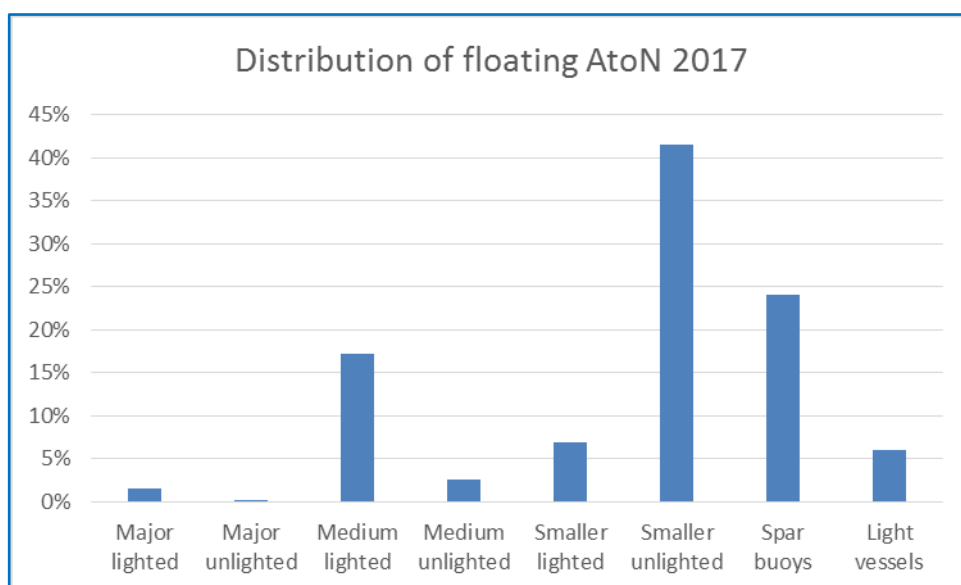


Figure 23 Distribution of floating AtoN 2017

9.1 Lighted floating AtoN

The number of lighted floating AtoN reported in 2017 is shown in Figure 24.

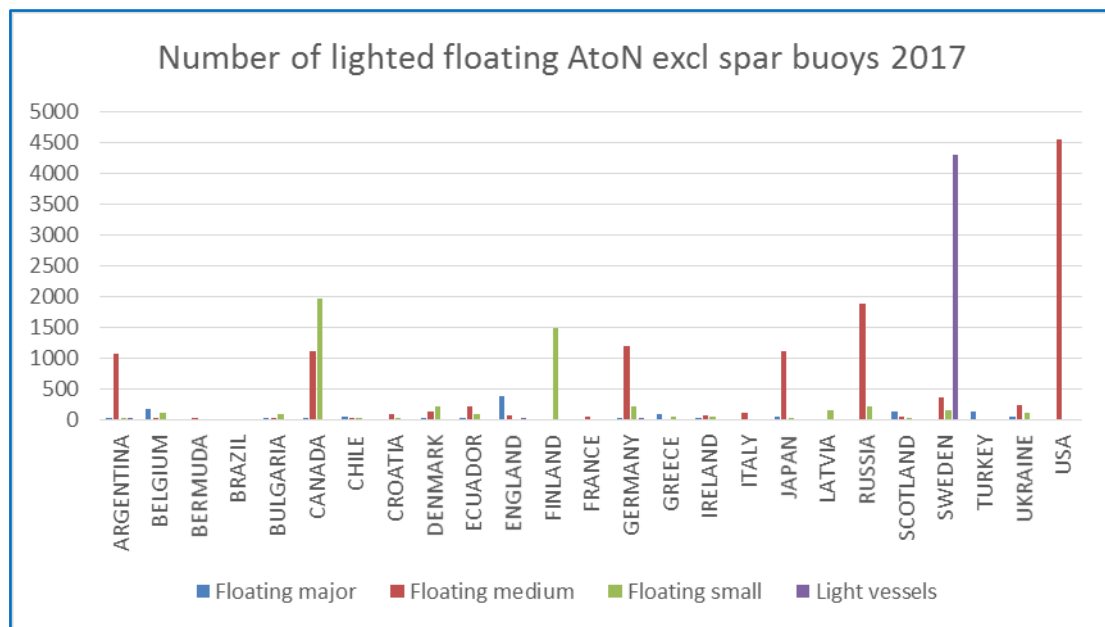


Figure 24 Number of lighted floating AtoN excluding spar buoys 2017

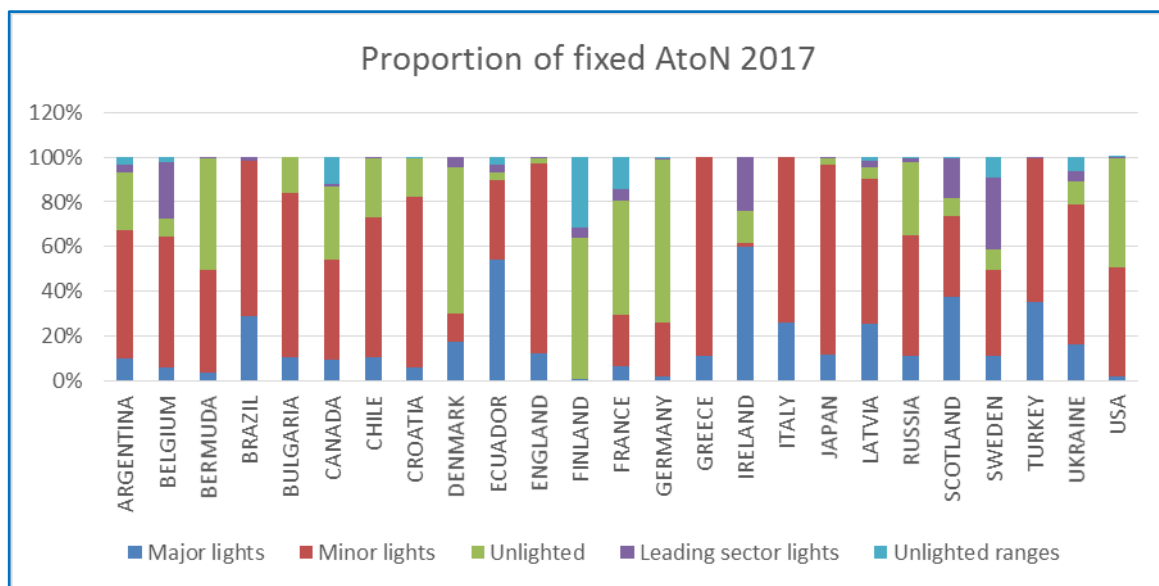


Figure 25 Distribution of fixed AtoN per country by proportion

9.2 Unlighted floating AtoN

Actual number of unlighted buoys is shown in ANNEX E.

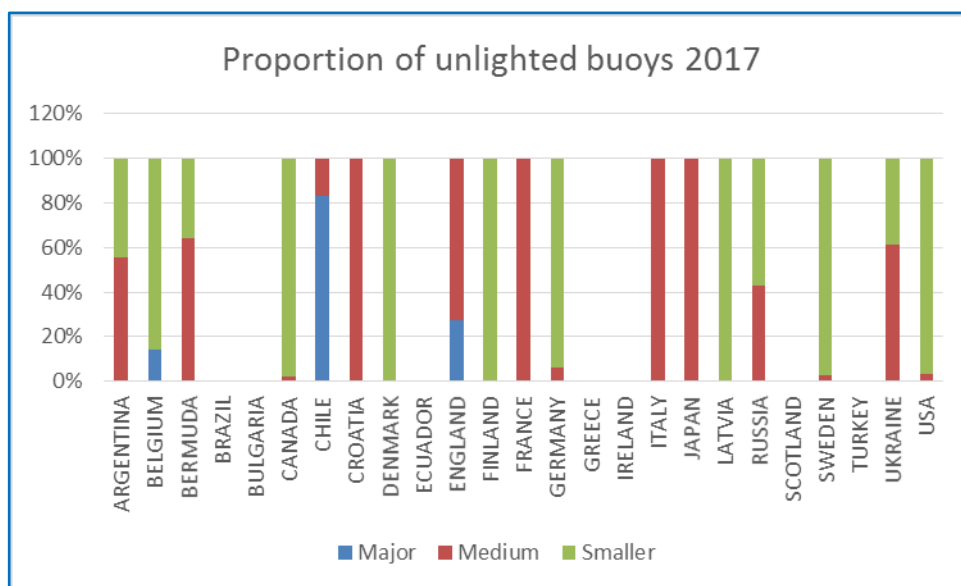


Figure 26 Proportion of unlighted buoys per country 2017

9.3 Trends in floating AtoN

Based on the responses to questionnaires from 2010 to 2017, the following pattern of floating AtoN was indicated. Please note that reporting on spar buoys and light vessels commenced in 2014.

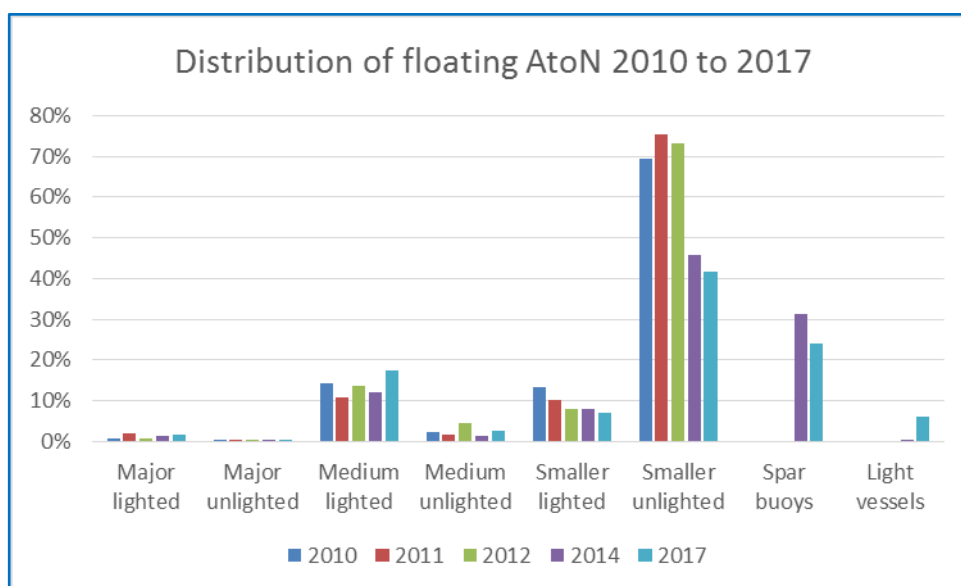


Figure 27 Percentage distribution of floating AtoN by AtoN type 2010 to 2017

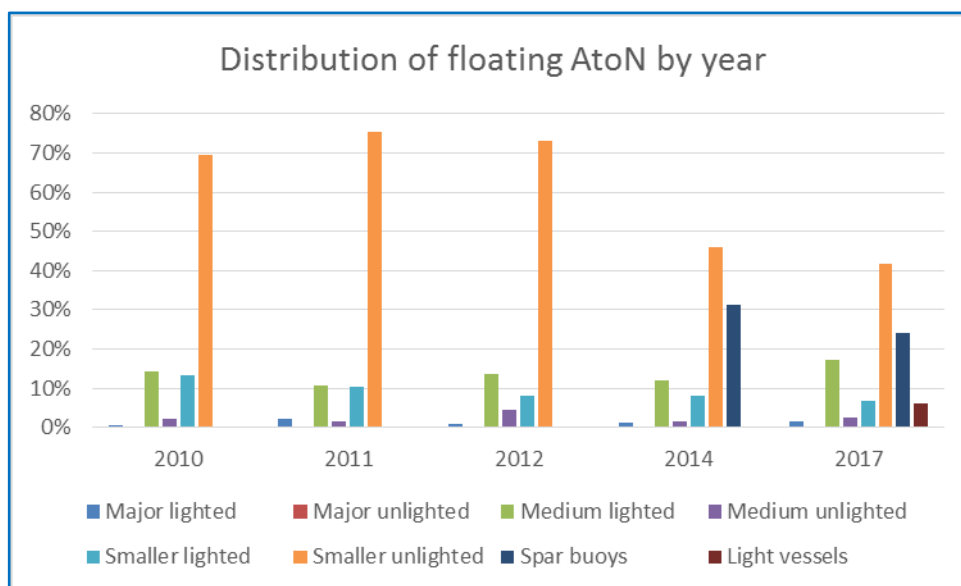


Figure 28 Percentage distribution of floating AtoN by year

9.4 Emergency wreck marking buoys (EWMB)

Emergency wreck marking buoys deployed in 2017 is shown in Figure 29.

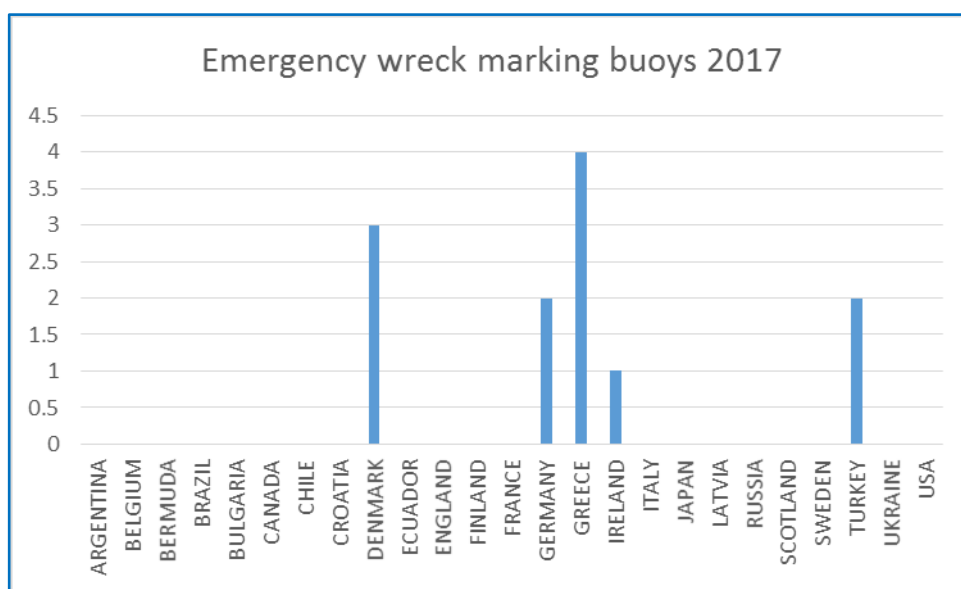


Figure 29 Emergency wreck marking buoys deployed in 2017

9.5 Buoy construction – steel vs plastic

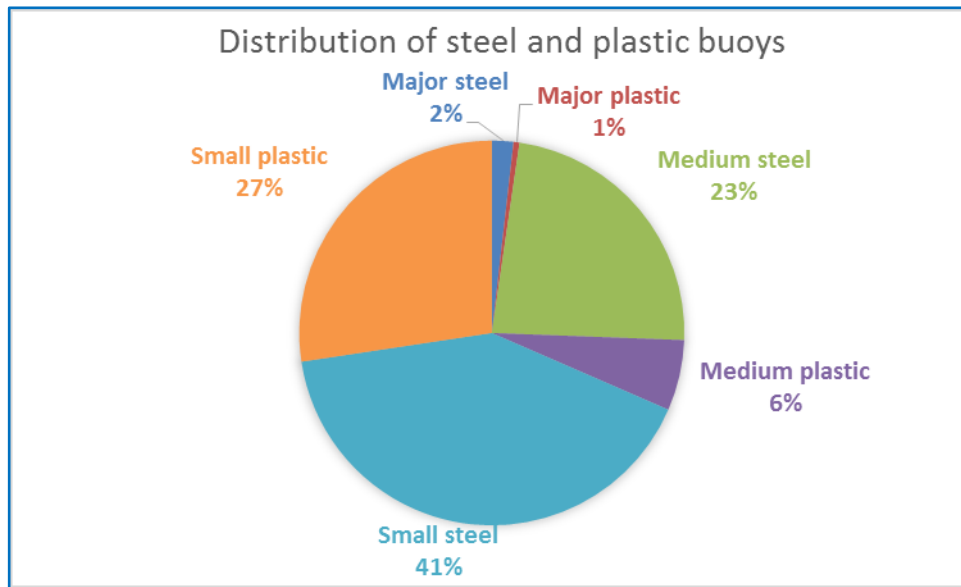


Figure 30 Proportion of steel and plastic buoys 2017

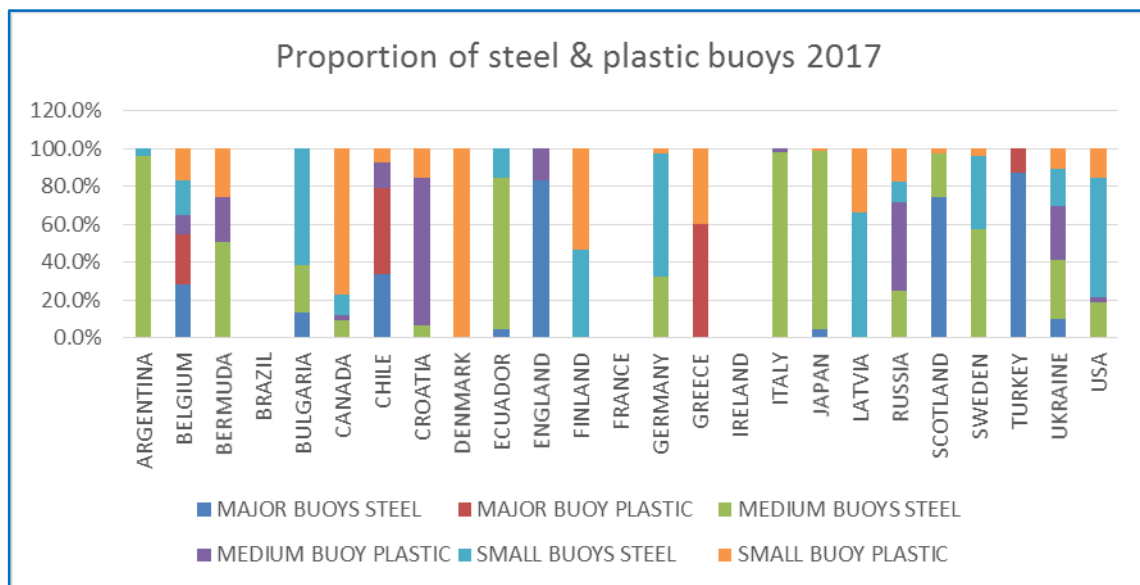


Figure 31 Proportion of steel and plastic buoys per country 2017

9.6 Remote monitoring of floating AtoN

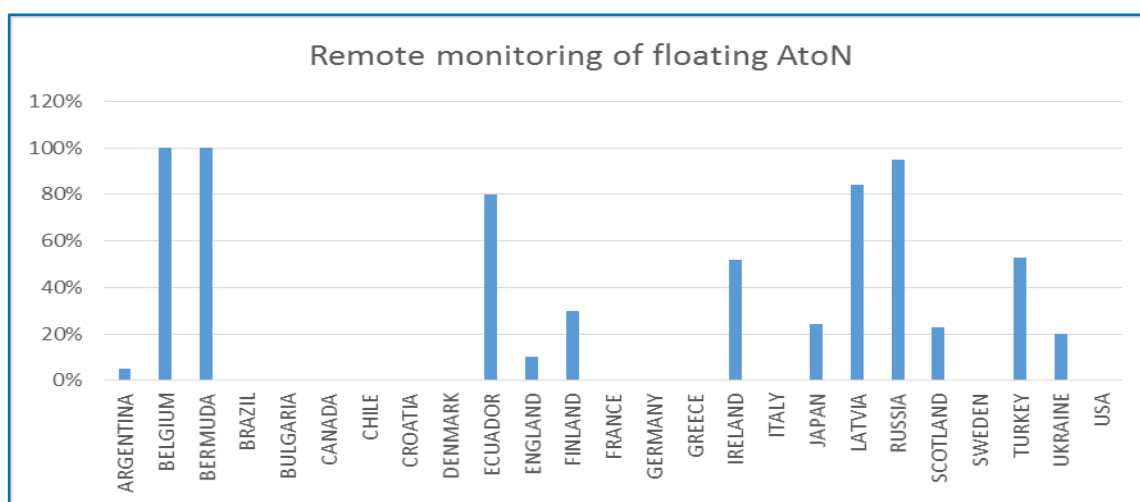


Figure 32 Percentage of floating AtoN with remote monitoring

10. SOUND SIGNALS

The following numbers of sound signals were reported in 2017.

Table 6 Number of sound signals 2017

Country	Bells and Gongs	Whistles	Fog Horns
Argentina	0	0	16
Belgium	3	0	2
Canada	233	113	121
Chile	0	0	6
Croatia	0	0	7
England	60	11	23
Germany	3	7	9
Greece	2	0	4
Latvia	1	0	0
Russia	5	0	11
Turkey	0	0	11
Ukraine	0	0	3
USA	610	170	237

Trends for sound signals for the period 2010 to 2017 were reported as follows.

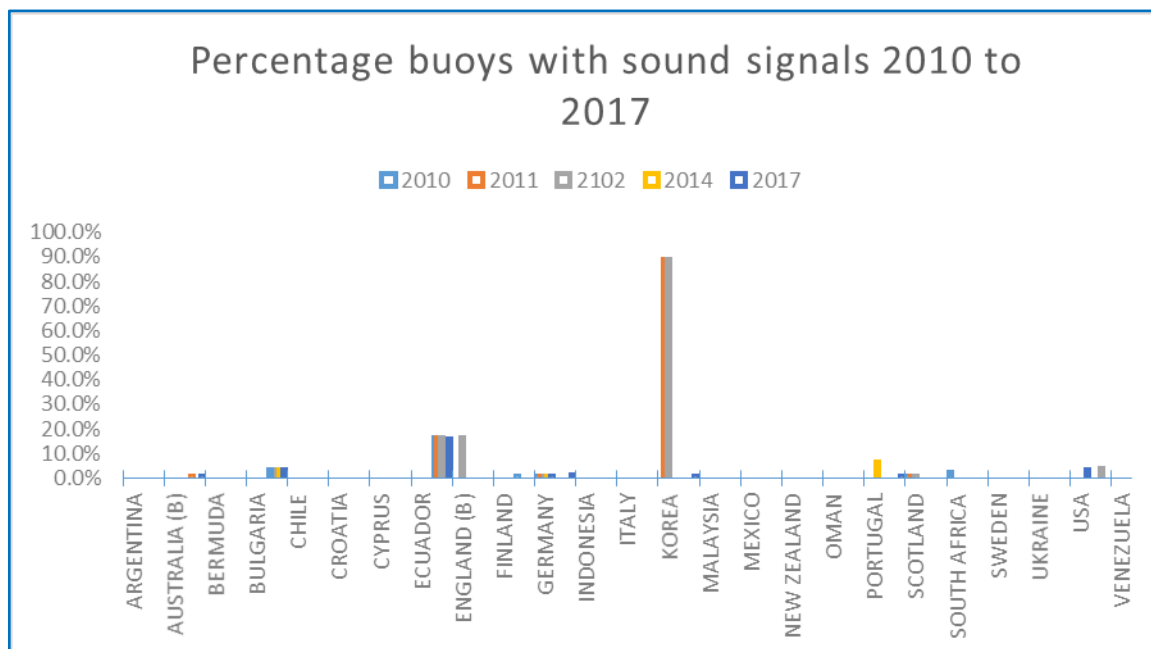


Figure 33 Percentage of all buoys (excluding spar buoys) fitted with sound signals (bells, gongs, whistles) 2010 to 2017

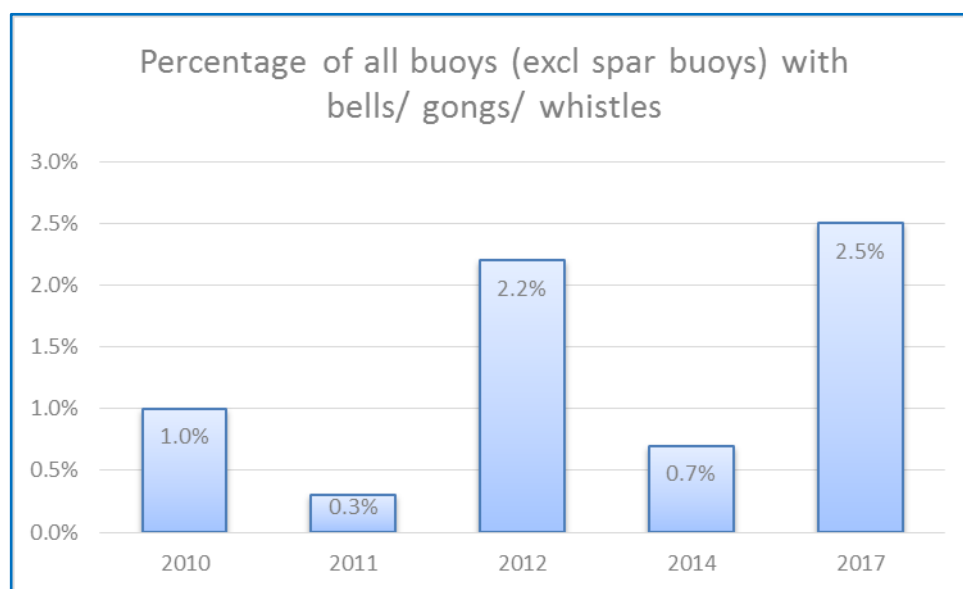


Figure 34 Percentage of all buoys (excluding spar buoys) fitted with bells, gongs, whistles

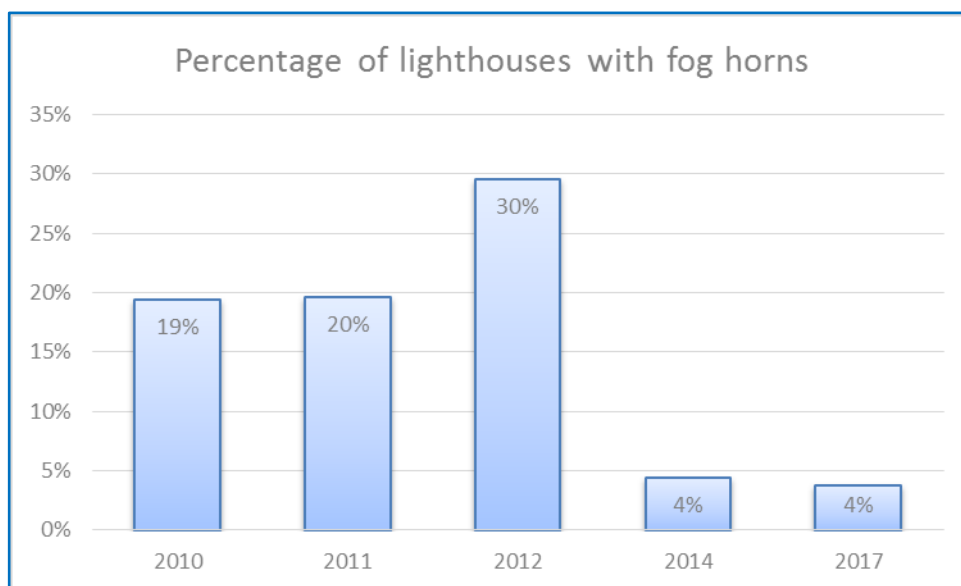


Figure 35 Percentage of lighthouses with fog horns 2010 to 2017

11. RADIO AIDS TO NAVIGATION

11.1 Differential GPS

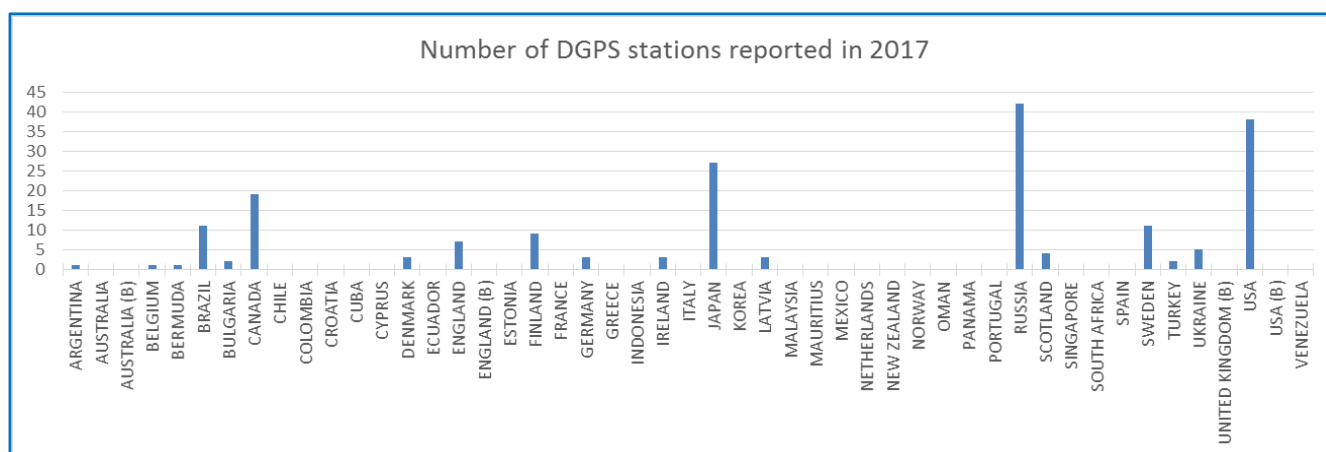


Figure 36 Number of DGPS stations reported in 2017

Respondents from 2010 to 2017 reported DGPS service as shown in Figure 37.

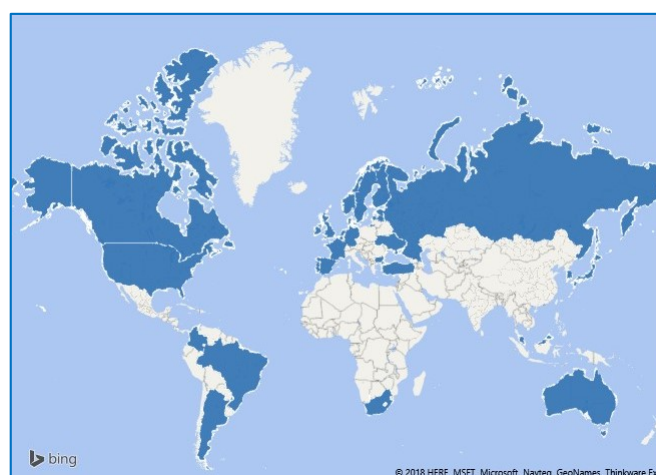


Figure 37 DGPS service worldwide based on 2010 to 2017 questionnaires

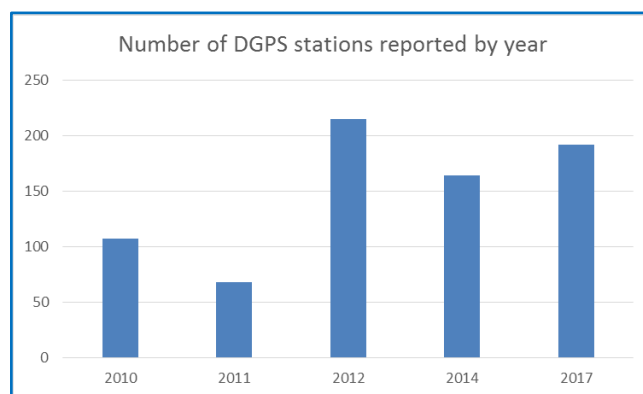


Figure 38 Number of DGPS stations reported by year

11.2 Loran

Respondents from 2010 to 2017 reported Loran service as shown in Figure 39.



Figure 39 Loran service based on 2010 to 2017 questionnaires

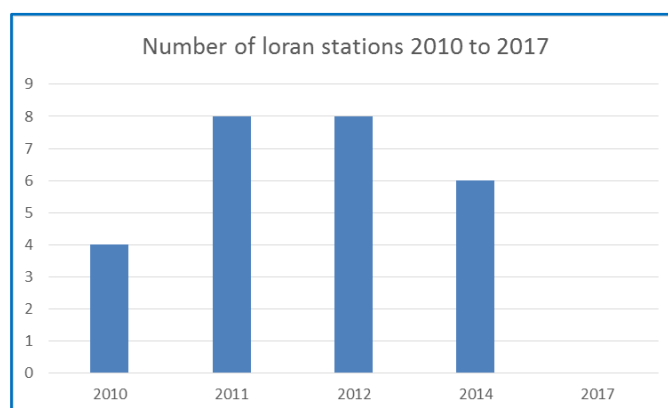


Figure 40 Number of Loran stations reported from 2010 to 2017

11.3 Automatic Identification System (AIS)

The use of AIS AtoN is summarised in Figure 41. No AIS repeaters were reported.

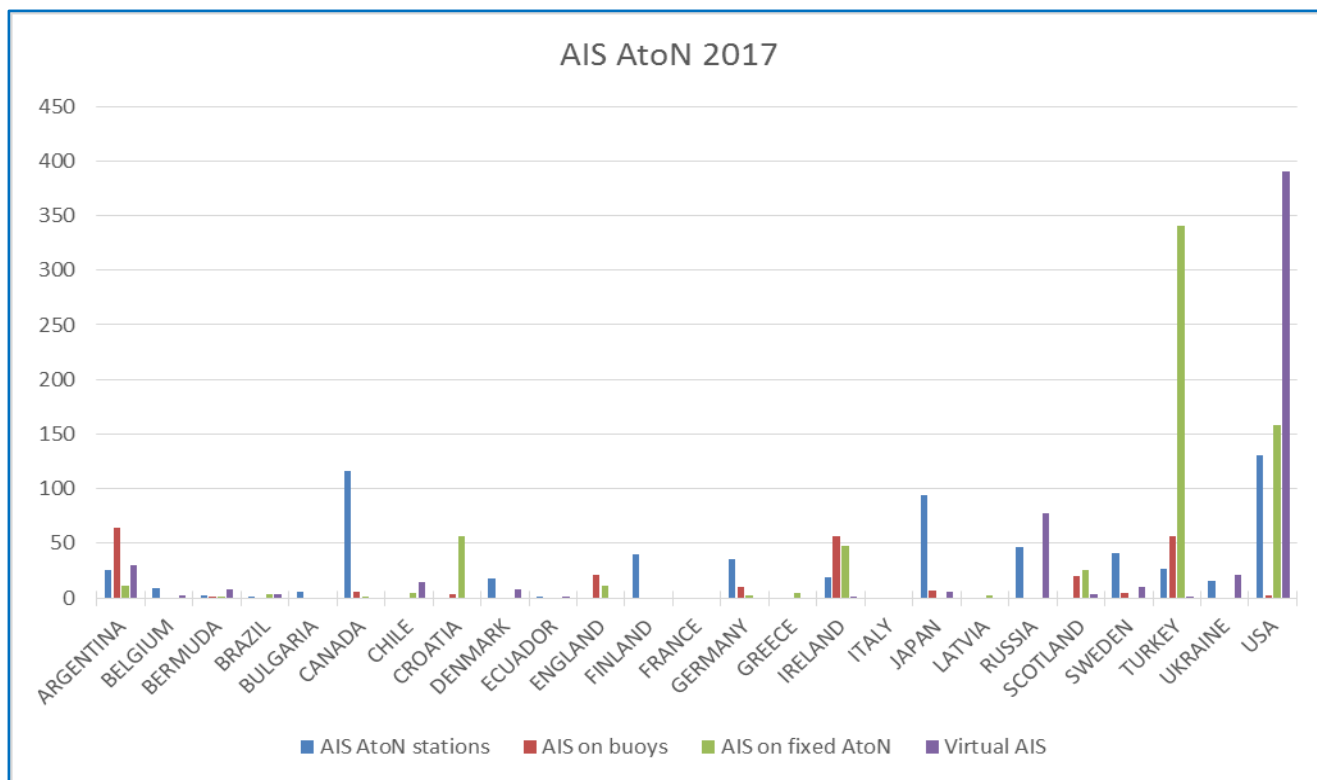


Figure 41 Deployment of AIS AtoN reported in 2017

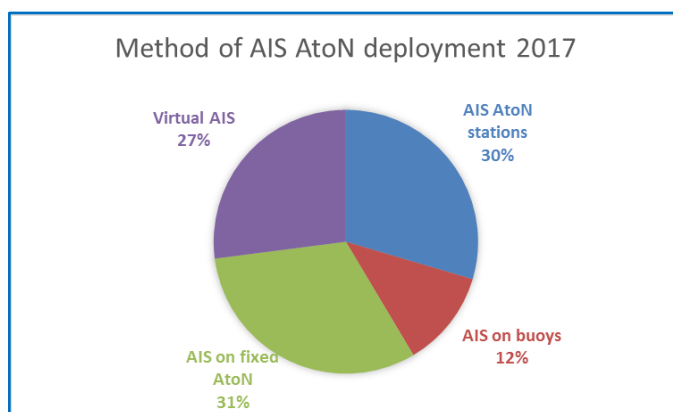


Figure 42 Method to AIS AtoN deployment 2017

Use of AIS AtoN as reported from 2010 to 2017 is shown in Figure 43.



Figure 43 Deployment of AIS AtoN (base station, fixed station AtoN, buoys AtoN, Virtual AIS AtoN) 2010 to 2017

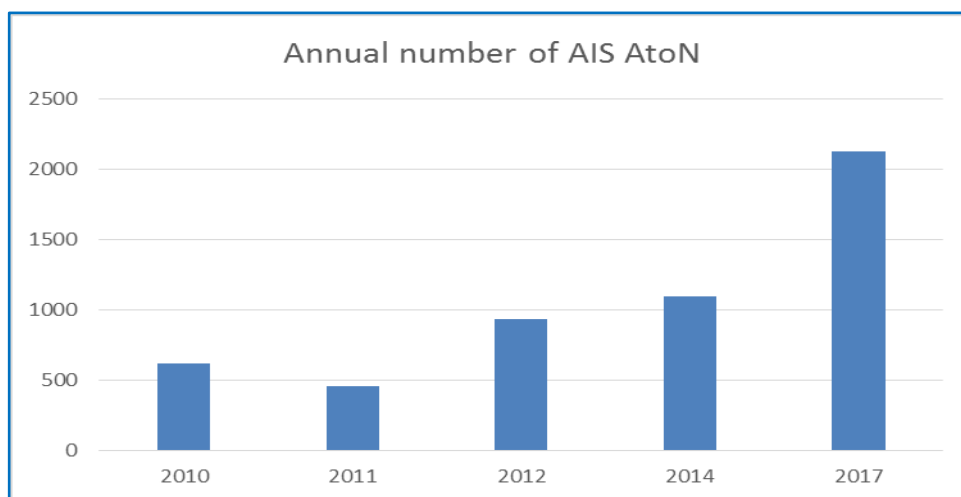


Figure 44 Annual number of AIS AtoN

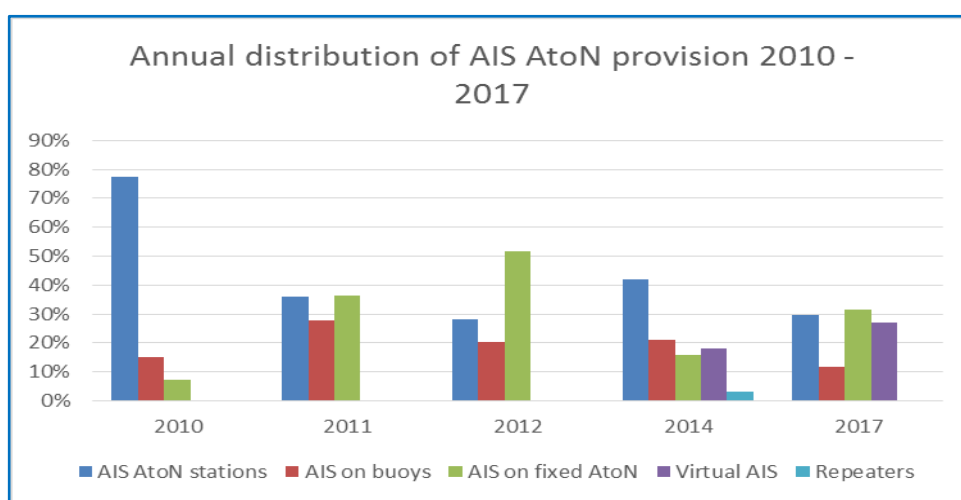


Figure 45 Annual distribution of methods of AIS AtoN provision 2010 to 2017

11.4 Racons

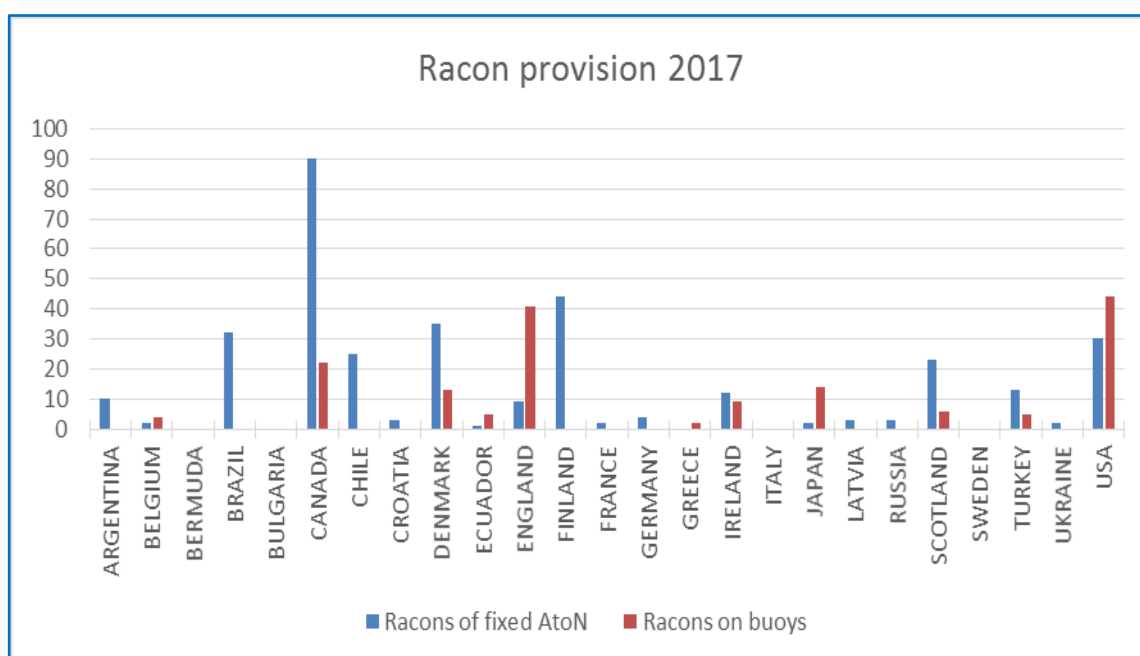


Figure 46 Racon provision 2017

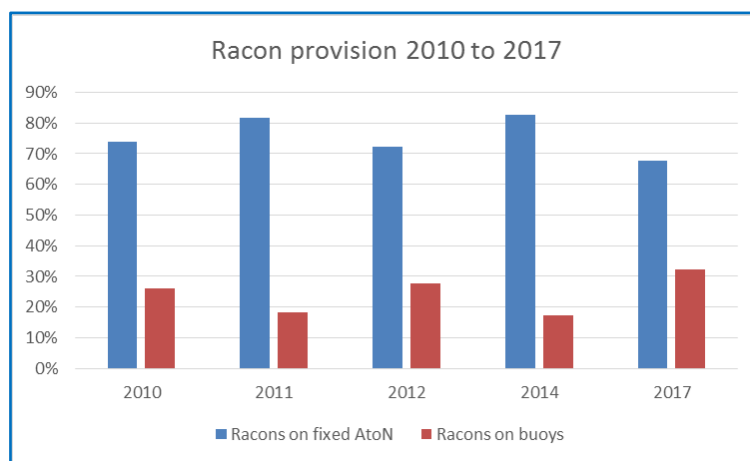


Figure 47 Racon provision on fixed AtoN and buoys 2010 to 2017

12. VESSEL TRAFFIC SERVICES

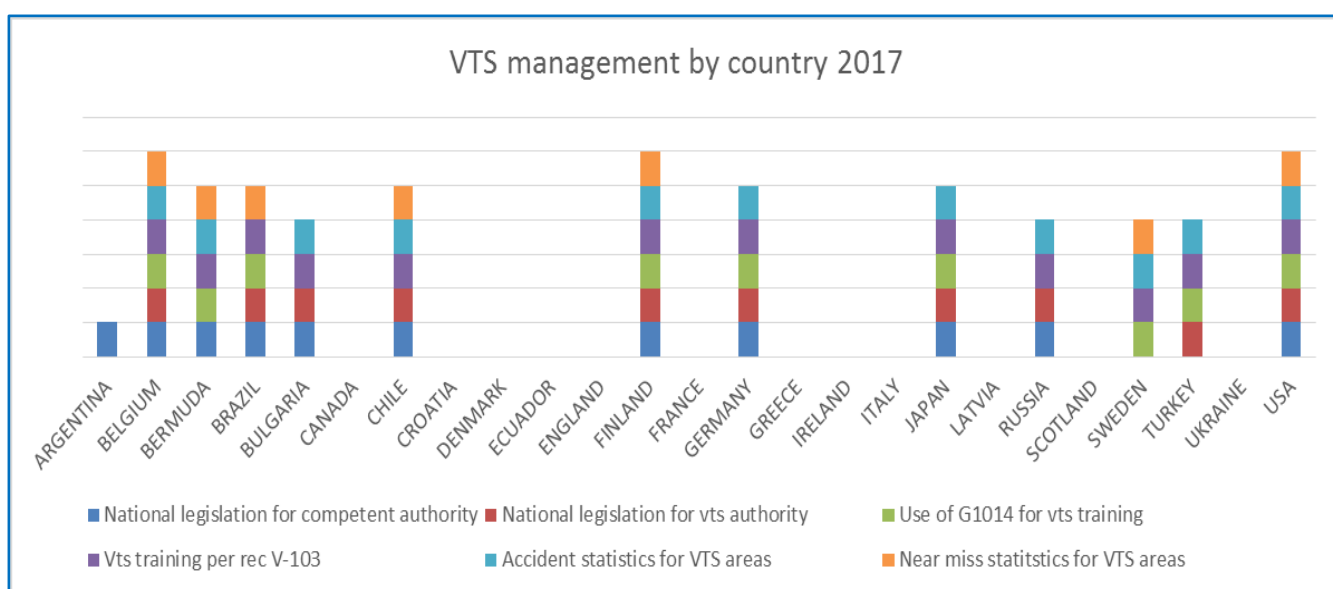


Figure 48 VTS management by country 2017

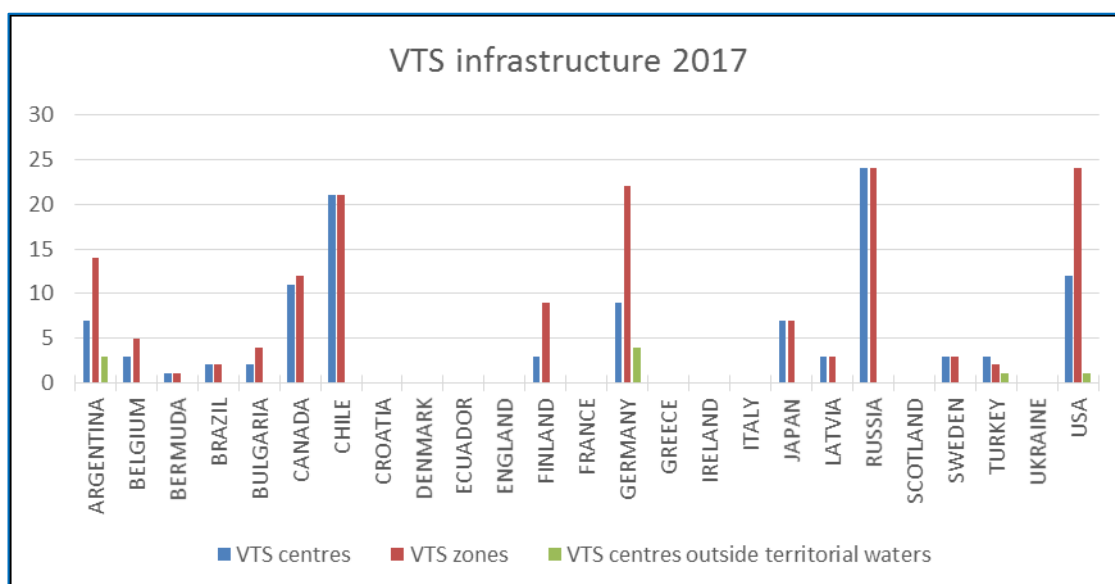


Figure 49 VTS infrastructure 2017

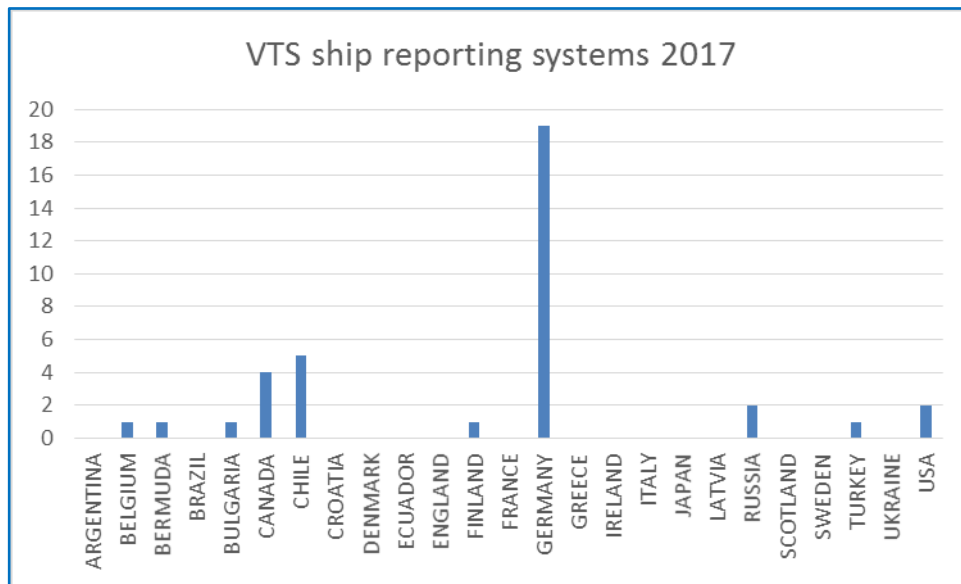


Figure 50 Number of ship reporting systems by country 2017

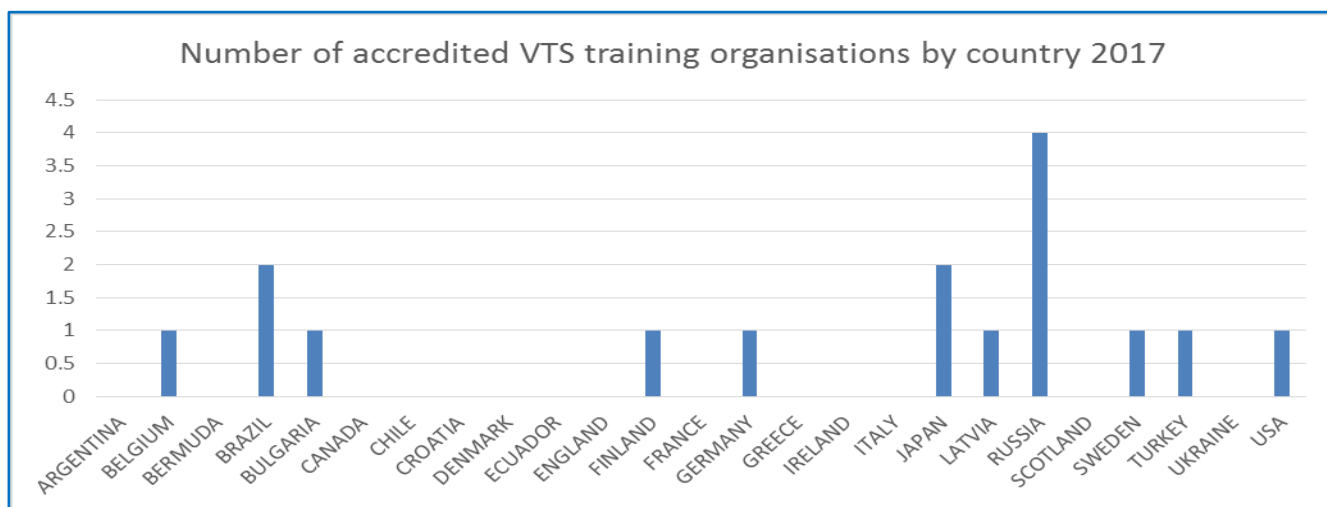


Figure 51 Number of accredited VTS training centres by country 2017



Figure 52 Countries reporting VTS management arrangements 2010 to 2017

13. SERVICE DELIVERY

13.1 Contracting out

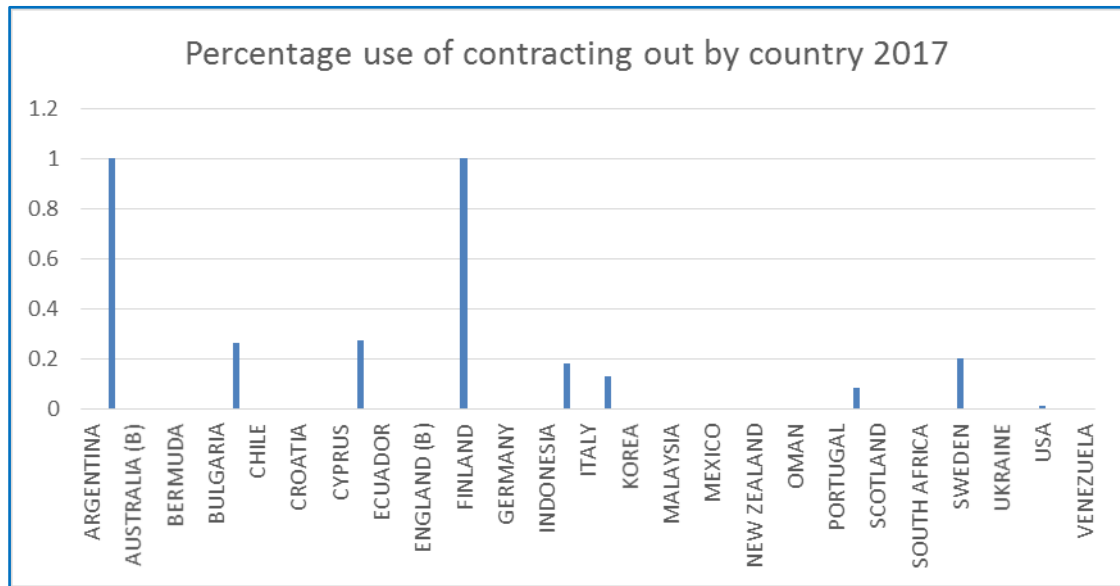


Figure 53 Percentage use of contracting out by country 2017

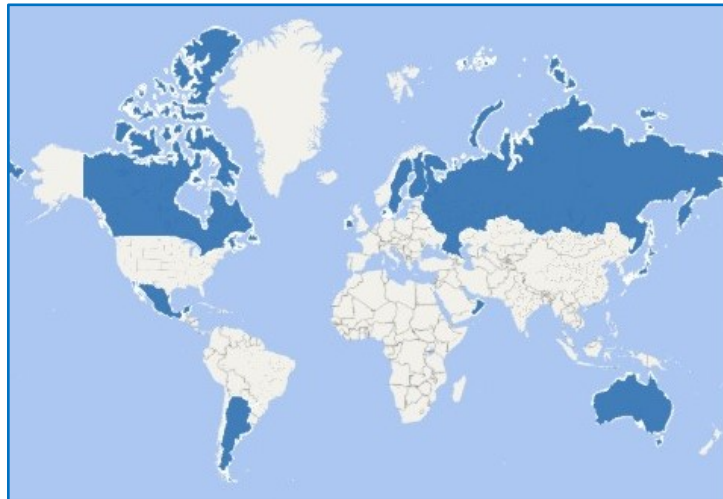


Figure 54 Countries using contracting out for some or all AtoN 2010 to 2017

13.2 Vessels

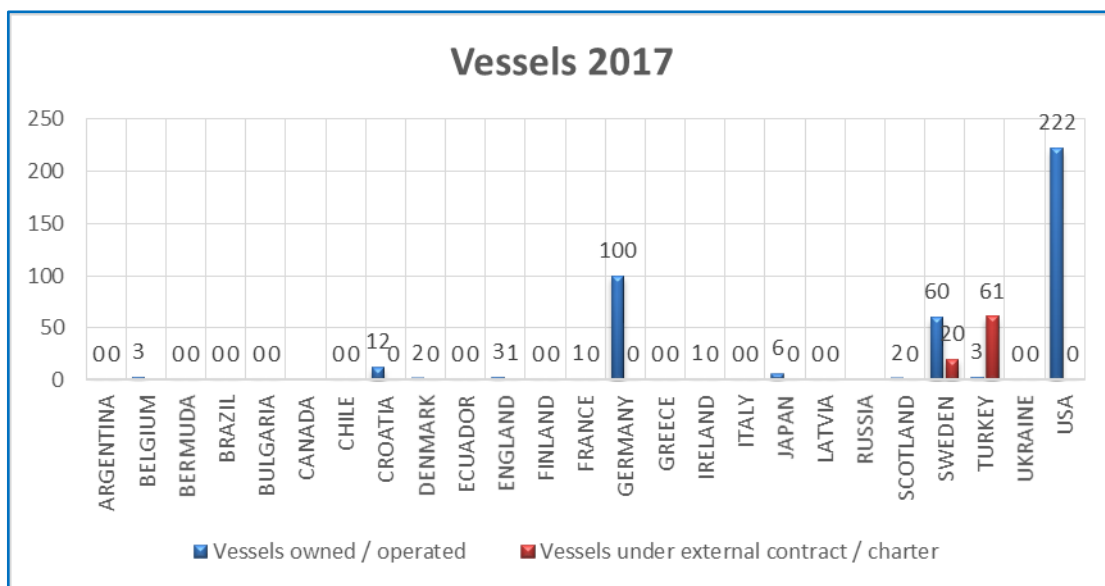


Figure 55 Vessel provision by country 2017

14. EQUIPMENT

14.1 Types of lights

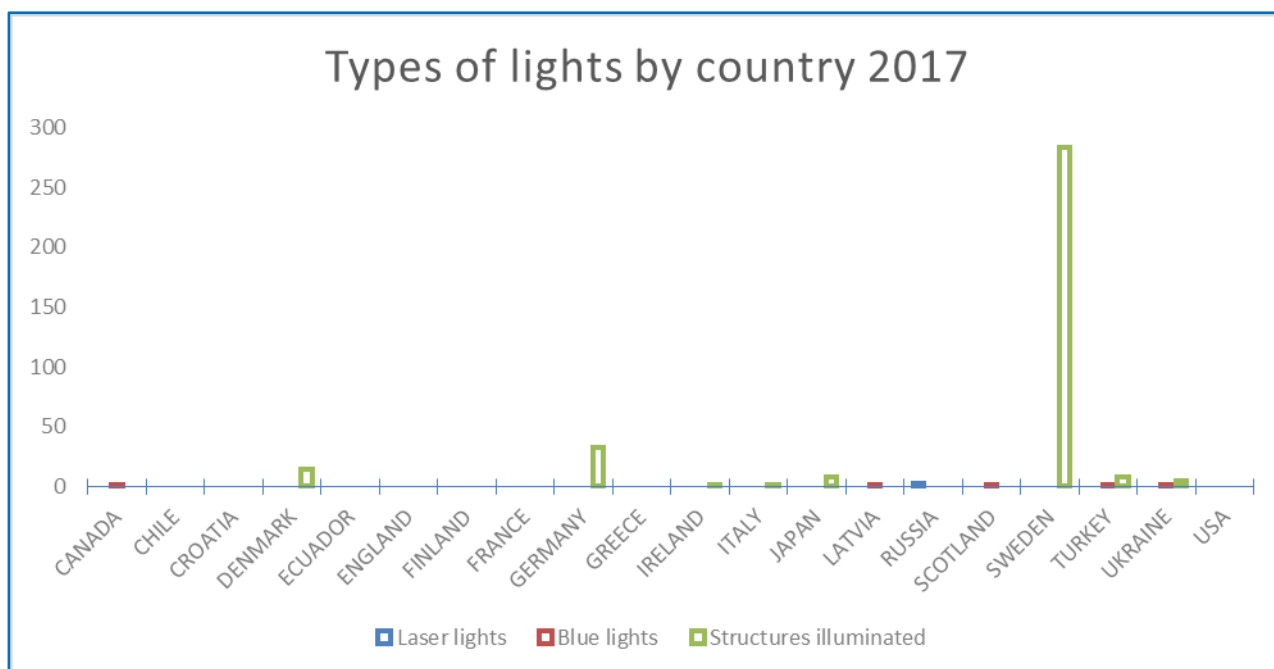


Figure 56 Types of lights by county 2017

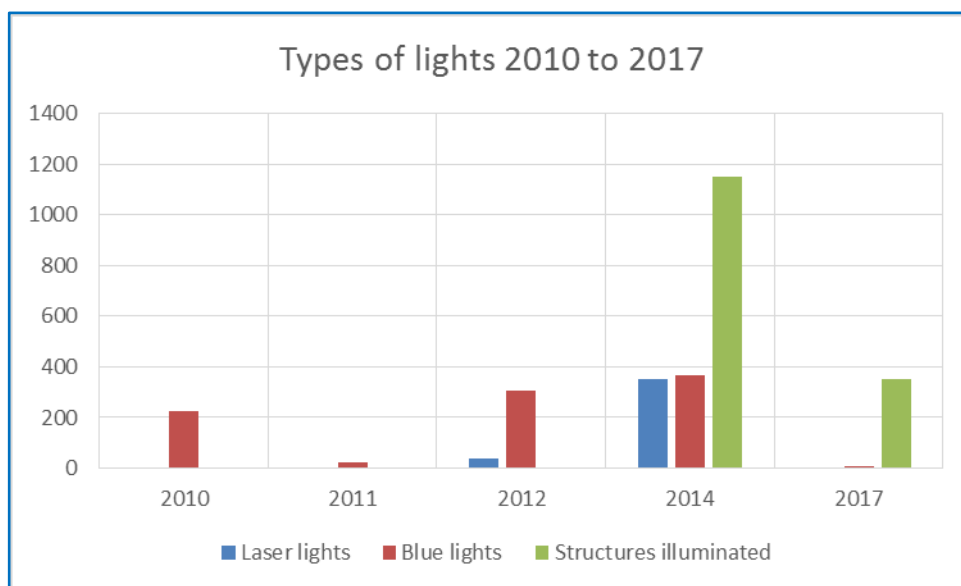


Figure 57 Types of lights 2010 to 2017

14.2 Traditional optic equipment

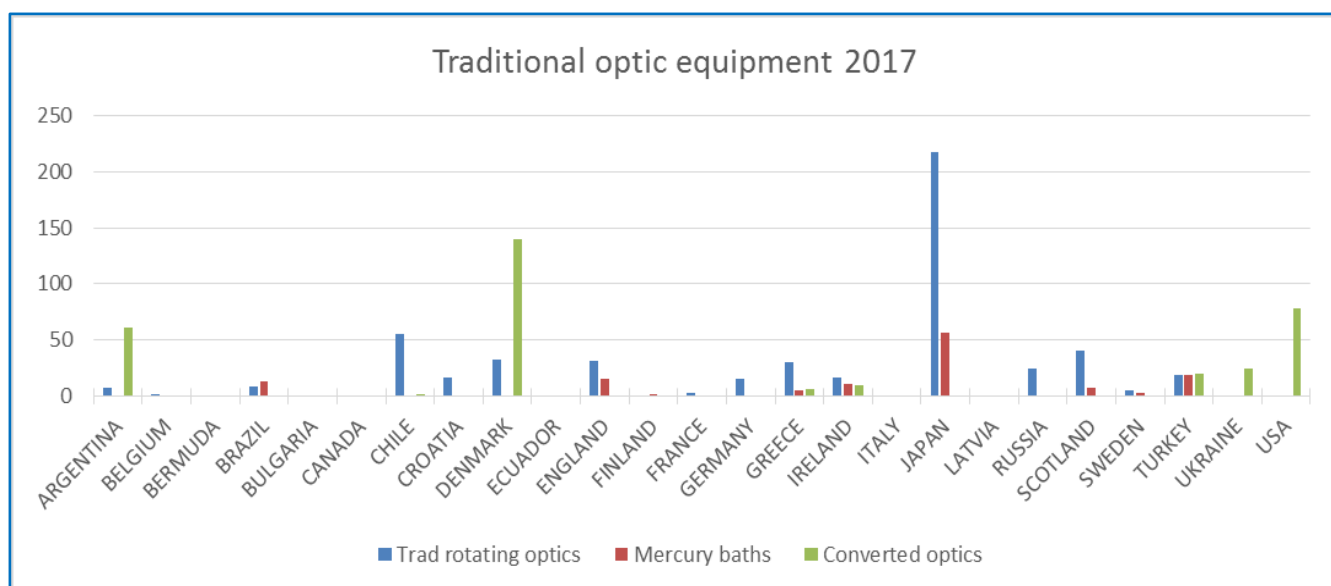


Figure 58 Use and type of traditional optic equipment 2017

14.3 LED lanterns

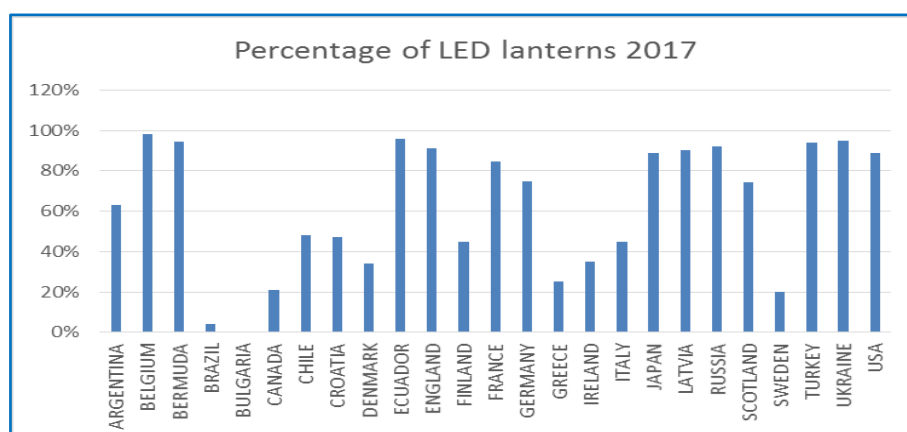


Figure 59 Percentage of LED lanterns by country 2017

14.4 Power systems

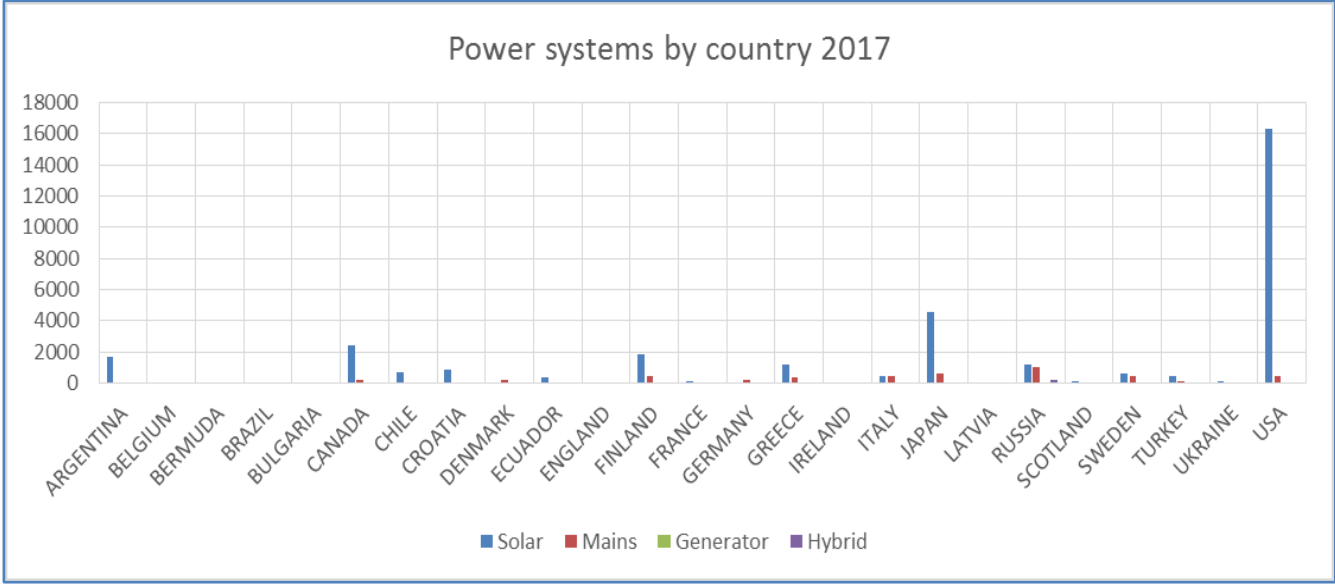


Figure 60 Power systems by country 2017

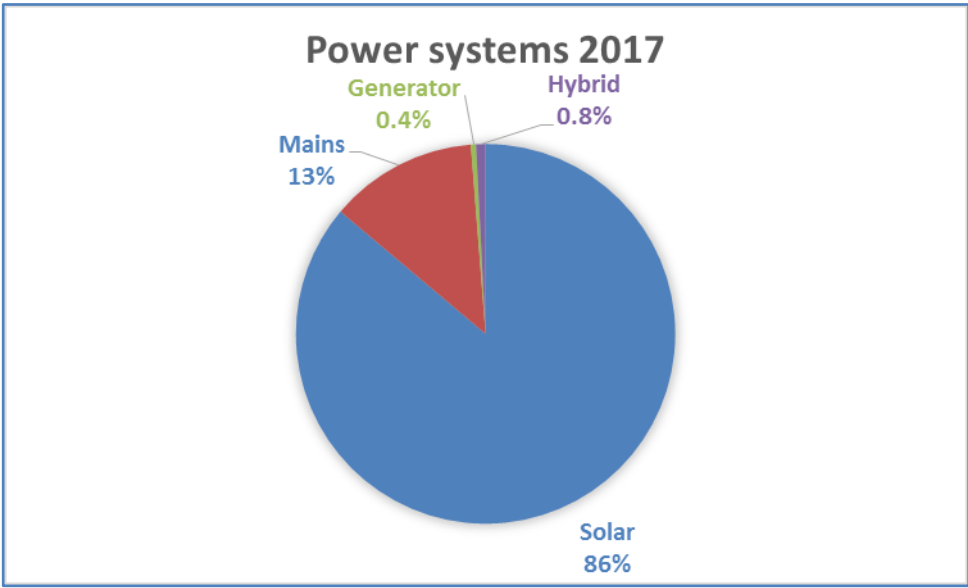


Figure 61 Trends in power systems 2017

15. FINANCE

Based on the questionnaires from 2010 to 2017, a levy on shipping is charged as follows.

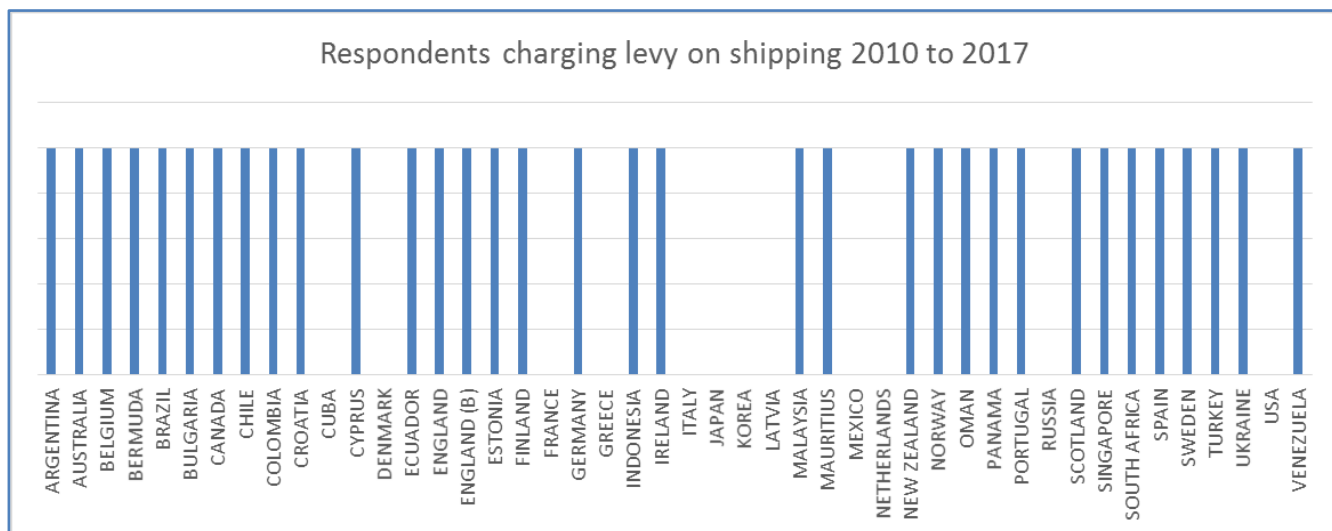


Figure 62 Respondents charging a levy on shipping 2010 to 2017

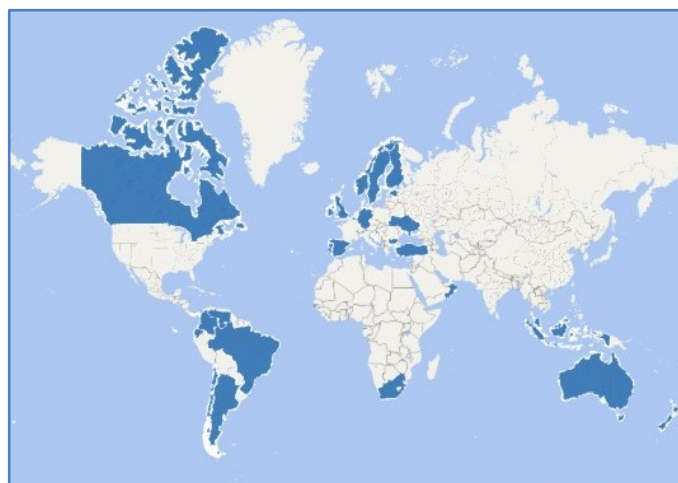


Figure 63 Countries charging a levy on shipping 2010 to 2017

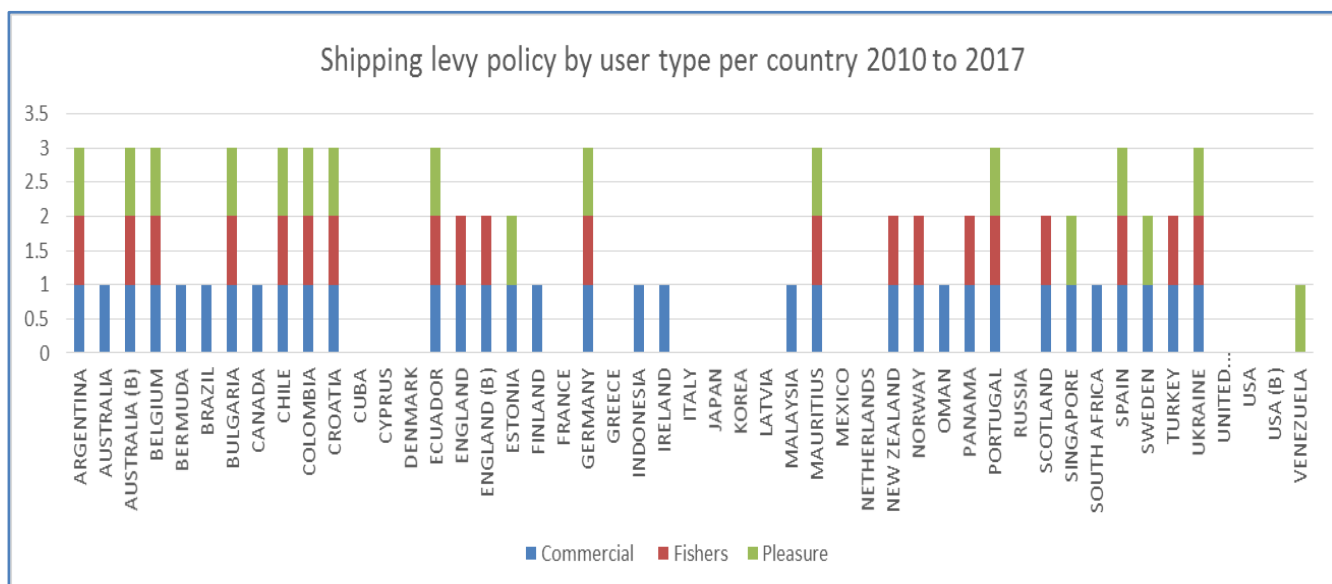


Figure 64 Shipping levy policy by user type per country 2010 to 2017

The chart in Figure 65 shows shipping organisations in each country that impose a levy on shipping.

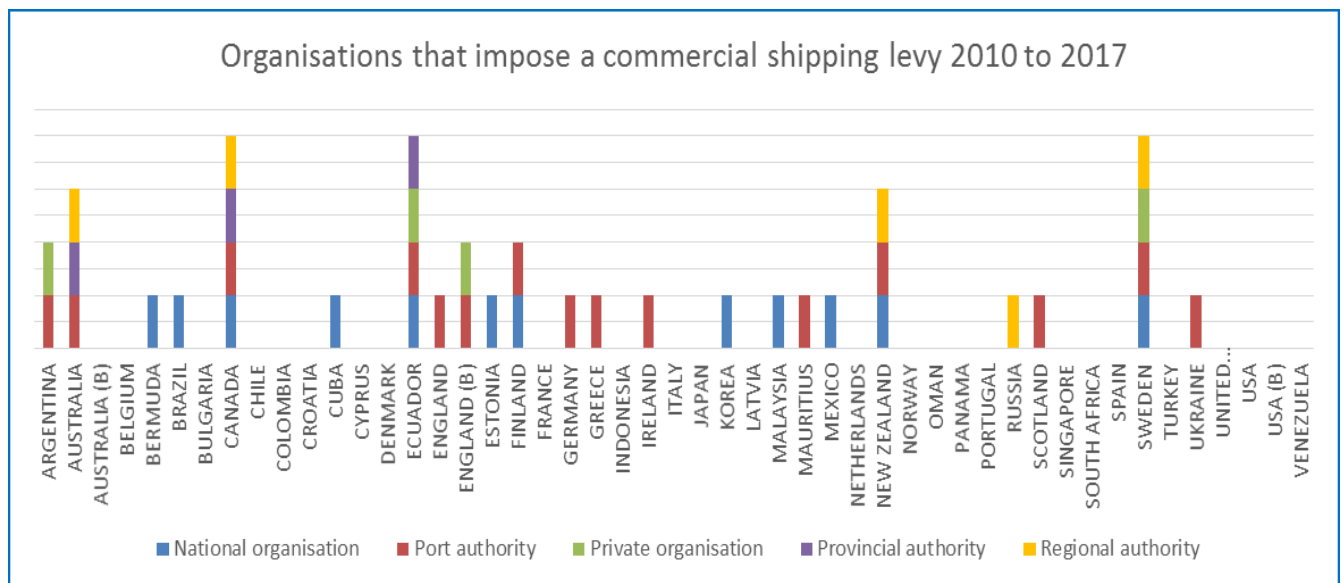


Figure 65 Organisations that impose a commercial shipping levy by country 2010 to 2017

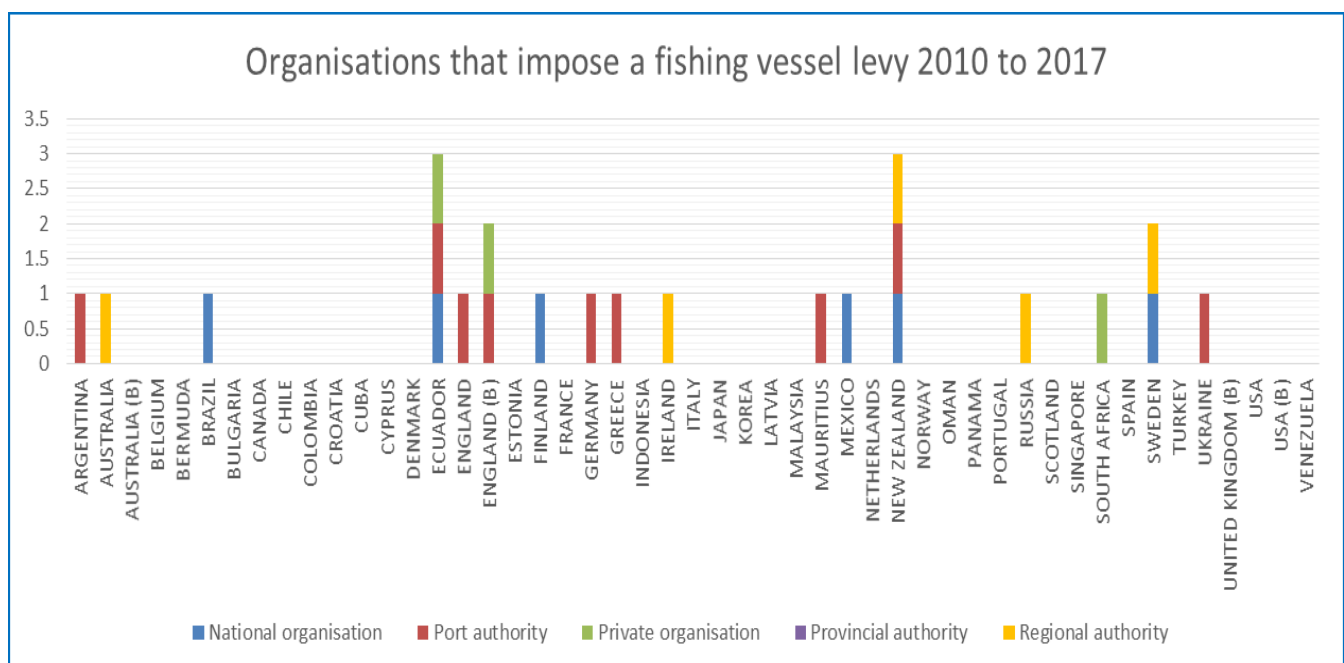


Figure 66 Organisations that impose a fishing shipping levy by country 2010 to 2017

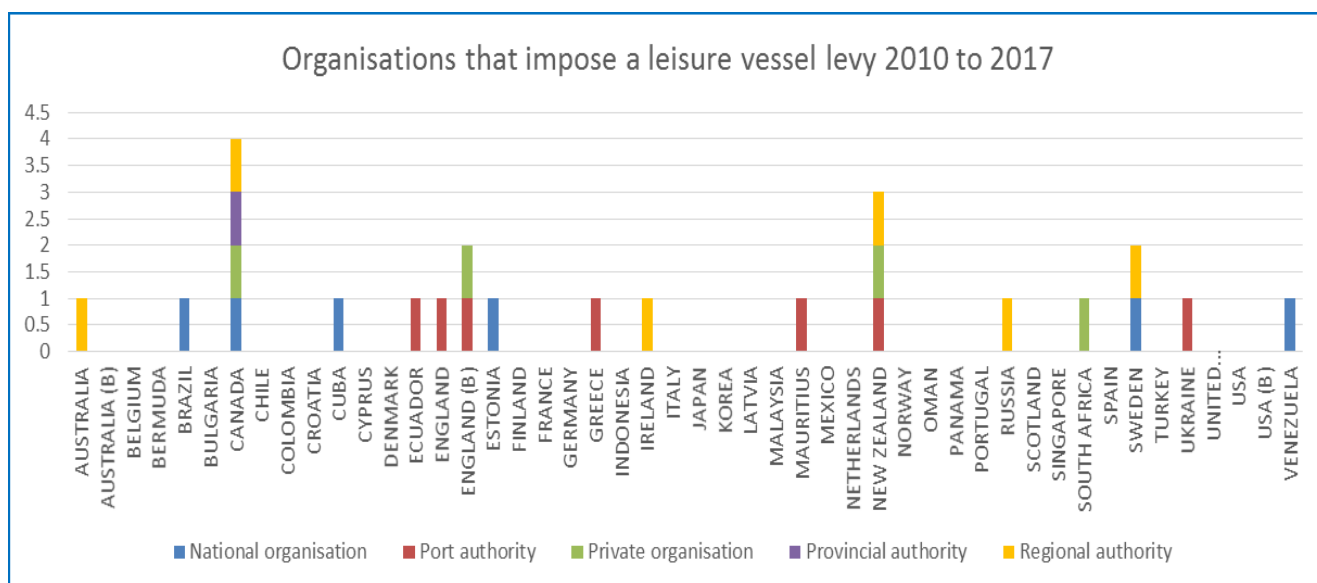


Figure 67 Figure 61 Organisations that impose a leisure shipping levy by country 2010 to 2017

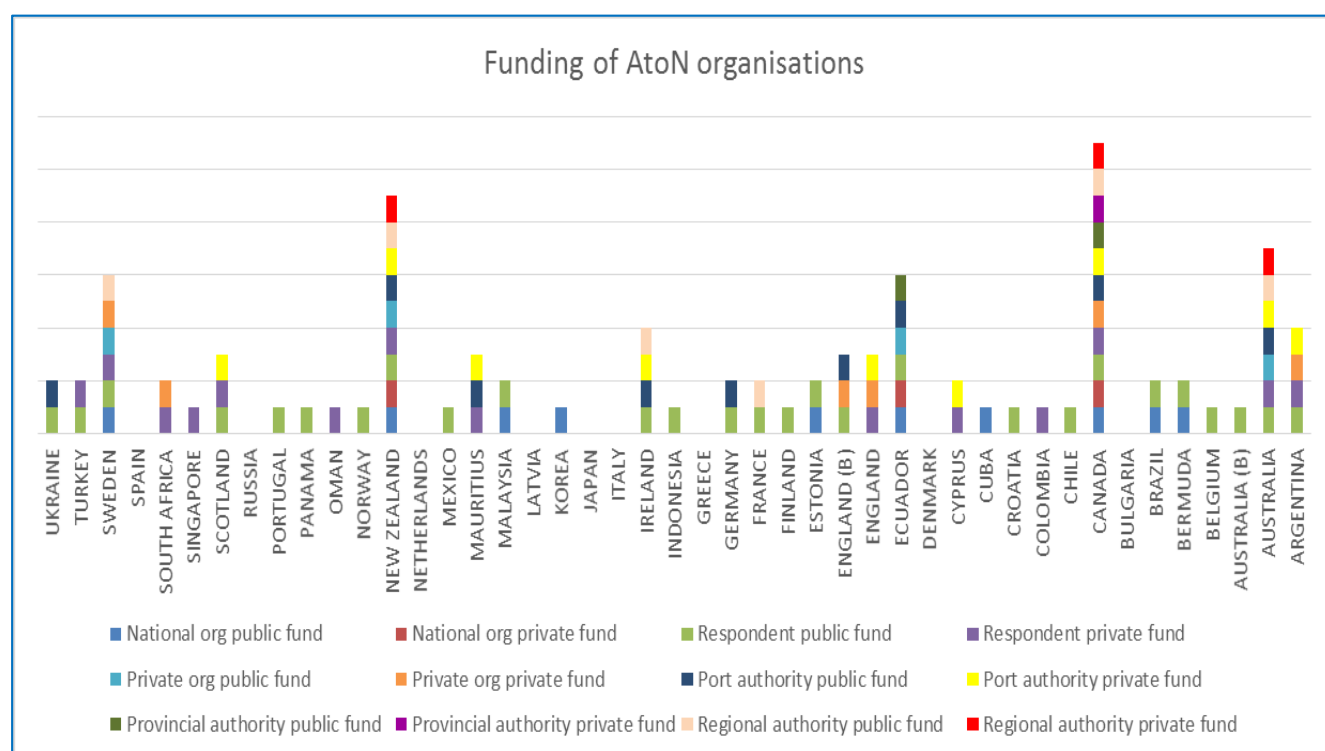


Figure 68 Funding of AtoN organisations

IALA QUESTIONNAIRE ON MARINE AIDS TO NAVIGATION

YEAR: 2017

COUNTRY NAME:

(please insert the country name here)

ORGANIZATION

NAME OF YOUR ORGANIZATION:

TYPE OF YOUR ORGANIZATION:

TYPE OF AUTHORITY:

QUALITY MANAGEMENT (Does your organization use:)

PERFORMANCE INDICATORS

ISO CERTIFICATION

RISK MANAGEMENT TOOLS

OTHER CERTIFICATION

ORGANIZATION RESPONSIBILITIES (Please select one or more):

AtoN PROVIDER

VTS

SUPERVISION OF AtoN PROVIDERS

AQUACULTURE

AtoN TRAINING

OFFSHORE PETROLEUM

HYDROGRAPHIC SERVICES

SEA DUMPING

PILOTAGE

RENEWABLE ENERGY

AIS

MARINE SPATIAL PLANNING

MARINE AIDS TO NAVIGATION STAFF (Please give numbers):

MAIN OFFICE:

LIGHTHOUSES:

DISTRICT DEPOTS:

SHIPS / VESSELS:

LEVY ON SHIPPING (Marine Aids to Navigation service fees)

Do these organizations charge any fees to users?

When do mariners pay fees? (free text)

What types of ships pay fees?

Do these organizations use public (State) funds and/or private funds?

Your organization:

Other organizations within your country:

National organization:

Private organizations:

Port authorities:

Provincial authorities:

Commercial

Fishing

Leisure

Commercial

Fishing

Leisure

Commercial

Fishing

Leisure

Commercial

Fishing

Leisure

Commercial

Fishing

Leisure

Public

Private

Public

Private

Public

Private

Public

Private

Public

Private

MARINE AIDS TO NAVIGATION (Please give numbers for each category):

Directly responsible for:

AtoN category 1

AtoN category 2

AtoN category 3

Total national:

AtoN category 1

AtoN category 2

AtoN category 3

FIXED MARINE AIDS TO NAVIGATION INCLUDING LIGHTHOUSES (Please give numbers):

LIGHTHOUSES
:

Staffed:

Automated
:

Remote
controlled
:

Alternative
-
ly used:

With legal
protection
as
historical
monument
s

Open to
public:

Number
of visitors
last year:

MAJOR LIGHTS (nominal range of 10 NM or over):

MINOR LIGHTS (nominal range under 10 NM):

UNLIT FIXED AIDS (daymarks only):

LEADING
LINES:

Sector
lights

Lit ranges

Unlit
ranges

PERCENTAGE MONITORED:

FLOATING MARINE AIDS TO NAVIGATION (Please give numbers for each category):

Major size (diameter of 3.0 M and over):

Lit:

Unlit:

Steel:

Plastic:

Medium size (diameter of 1.5 to 3.0 M):

Lit:

Unlit:

Steel:

Plastic:

Smaller size (diameter under 1.5 M):

Lit:

Unlit:

Steel:

Plastic:

Other buoys:

Regional
authorities:

Commercial

Public

Fishing

Private

Leisure

GENERAL COMMENTS AND FUTURE INTENTIONS (please use the free text box below)

Spar buoys: lightvessels

Emergency wreck
buoys:
(deployed in 2017)

PERCENTAGE MONITORED:

SOUND SIGNALS

Bells/Gongs Whistles Fog signals

RADIO AIDS TO NAVIGATION

Differential GPS (DGPS)	Number of stations:	<input type="text"/>	
Loran	Number of transmitters:	<input type="text"/>	Number of chains: <input type="text"/>
Automatic Identification Systems (AIS)	Base stations:	<input type="text"/>	
	Repeaters:	<input type="text"/>	
	On fixed aids:	<input type="text"/>	
	On buoys:	<input type="text"/>	
	Virtual AIS deployed:	<input type="text"/>	
Racon	Installed on fixed aids:	<input type="text"/>	Installed on buoys: <input type="text"/>
Comments:	(e.g. future trends...)		

VESSEL TRAFFIC SERVICES (VTS). Does your organization have:

National legislation for the appointment of a competent authority:	<input type="text"/>
National legislation for the appointment of a VTS authority:	<input type="text"/>
Use of IALA Guideline 1014 on Accreditation and Approval Process for VTS Training:	<input type="text"/>
VTS personnel trained according to IALA recommendation V-103:	<input type="text"/>
Accident statistics for the VTS areas:	<input type="text"/>
Near-miss statistics for the VTS areas:	<input type="text"/>

Number of VTS centres:

Number of VTS areas:

Number of SRS:

Number of VTS centres operating outside territorial waters:

Number of organizations accredited for VTS training:

SERVICE DELIVERY (please give numbers)

Marine Aids to Navigation under external contract (in percentage):

Vessels owned/operated:

Vessels under external contract/ charter:

EQUIPMENT

Additional questions on service equipment (please give numbers):

Laser lights in service:	<input type="text"/>	Traditional rotating optics:	<input type="text"/>
Blue lights in service:	<input type="text"/>	Mercury baths:	<input type="text"/>
LED lanterns in service (in percentage):	<input type="text"/>	Converted optics:	<input type="text"/>
Structures illuminated:	<input type="text"/>		

Power systems (please give numbers):

Solar:	<input type="text"/>	Mains:	<input type="text"/>	Generator	<input type="text"/>	Hybrid	<input type="text"/>
				:		:	

ANNEX B

QUESTIONNAIRE RESPONDENTS 2010-2017

Country	2010	2011	2012	2014	2017
Argentina	1			1	1
Australia	1	1	1	1	
Australia (B)	1				
Belgium		1	1	1	1
Bermuda			1	1	1
Brazil			1	1	1
Bulgaria				1	1
Canada	1		1	1	1
Chile	1			1	1
Colombia				1	
Croatia					1
Cuba				1	
Cyprus	1			1	
Denmark	1	1	1	1	1
Ecuador		1	1	1	1
England	1	1	1		1
England (B)			1		
Estonia	1			1	
Finland	1	1	1	1	1
France	1		1		1
Germany	1	1	1	1	1
Greece	1				1
Indonesia		1			
Ireland	2	1	1	1	1
Italy					1
Japan				1	1
Korea		1	1		
Latvia					1
Malaysia		1	1		
Mauritius		1			
Mexico	1				
Netherlands				1	
New Zealand			1		
Norway		1	1	1	
Oman	1	1	1		
Panama			1		
Portugal	1	1	1	1	
Russia					1
Scotland	1	1	1	1	1
Singapore				1	
South Africa	1				
Spain				1	
Sweden	1				1
Turkey			1		1

Country	2010	2011	2012	2014	2017
Ukraine	1	1	1	1	1
United Kingdom (B)			1		
USA					1
USA (B)			1		
Venezuela				1	
Grand Total	22	17	25	26	25

Number of AtoN						
	Directly responsible			National		
Country	Category 1	Category 2	Category 3	Category 1	Category 2	Category 3
Argentina	381	1326	272	381	1326	272
Australia	960	1762	5470	960	1762	5470
Belgium	0	0	0	0	0	0
Bermuda	10	100	32	10	100	32
Brazil	3274	1748	1337	3274	1748	1337
Bulgaria	0	0	0	0	0	0
Canada	1861	10774	4672	1861	10774	4672
Chile	70	837	739	70	837	739
Colombia	135	92	0	135	92	0
Croatia	270	374	305	270	374	305
Cuba	0	0	0	0	0	0
Cyprus	0	0	0	0	0	0
Denmark	186	1971	4382	186	1971	4382
Ecuador	64	289	70	64	289	70
England	154	949	10733	154	949	10733
Estonia	176	345	626	176	345	626
Finland	0	0	0	0	0	0
France	0	0	0	0	0	0
Germany	1837	3930	4850	1837	3930	4850
Greece	140	1092	363	140	1092	363
Ireland	69	592	1964	69	592	1964
Italy	150	1662	1174	150	1662	1174
Japan	975	2783	2719	975	2783	2719
Latvia	123	93	92	123	93	92
Netherlands	165	1665	2222	165	1665	2222
Norway	0	0	0	0	0	0
Portugal	53	86	939	53	86	939
Russia	1622	2501	476	1622	2501	476
Scotland	423	1344	784	423	1344	784
Singapore	0	70	100	0	70	100
Spain	334	1097	1482	334	1097	1482
Sweden	563	373	167	563	373	167

Number of AtoN						
	Directly responsible			National		
Country	Category 1	Category 2	Category 3	Category 1	Category 2	Category 3
Turkey	240	180	191	240	180	191
Ukraine	119	106	502	119	106	502
USA	1281	10092	22544	1281	10092	22544
Venezuela	0	406	0	0	406	0

Country	Major lights	Minor lights	Unlighted	Leading sector lights	Unlighted ranges
Argentina	82	477	213	29	27
Belgium	3	30	4	13	1
Bermuda	5	64	70	1	0
Brazil	217	525	0	10	
Bulgaria	2	14	3	0	0
Canada	522	2489	1801	73	656
Chile	113	682	292	4	0
Croatia	58	748	169	0	6
Denmark	150	106	569	37	0
Ecuador	65	43	4	4	4
England	66	453	13	1	0
Finland	45	0	5063	367	2505
France	19	70	153	16	43
Germany	108	1653	4925	49	12
Greece	171	1424	0	0	0
Ireland	65	2	16	26	0
Italy	222	641	0	0	0
Japan	437	3184	107	17	0
Latvia	27	69	5	3	2
Russia	510	2546	1543	101	11
Scotland	105	101	23	50	1
Sweden	242	861	210	718	210
Turkey	172	314	0	3	0
Ukraine	59	231	39	17	22
Usa	350	9978	10020	18	33

Country	Major lighted (3m dia)	Major unlighted (3m dia)	Medium lighted (1.5-3m dia)	Medium unlighted (1.5-3m dia)	Smaller lighted (<1.5m dia)	Smaller unlighted (<1.5m dia)	Spar buoys	Light vessels
Argentina	7	0	1070	68	24	54	25	1
Belgium	179	1	32	0	110	6	7	0
Bermuda	0	0	30	46	0	26	26	0
Brazil	0	0	0	0	0	0	0	0
Bulgaria	18	0	35	0	86	0	0	0
Canada	16	13	1115	121	1962	7398		
Chile	52	35	8	7	8	0	23	0
Croatia	0	0	78	12	16	0	0	0
Denmark	3	0	119	0	211	33	620	0
Ecuador	12	0	218	0	82	0	0	0
England	382	3	68	8	0	0	0	9
Finland	0	0	0	0	1487	88	16111	0
France	0	0	52	83	0	0	0	0
Germany	10	0	1192	179	204	2708	150	2
Greece	81	0	0	0	54	0	0	0
Ireland	8	0	69	0	42	0	0	0
Italy	0	0	114	13	0	0	0	0
Japan	53	0	1118	21	16	0	166	0
Latvia	0	0	0	0	149	20	20	0
Russia	0	0	1881	591	207	783		
Scotland	125	0	39	0	4	0	0	0
Sweden	0	0	359	3	160	108	70	4308
Turkey	125	0	0	0	0	0	0	0
Ukraine	51	0	236	69	110	44	1	0
USA	0	0	4545	598	0	18527	0	0



10, rue des Gaudines - 78100 Saint Germain en Laye, France
Tél. +33 (0)1 34 51 70 01- Fax +33 (0)1 34 51 82 05 - contact@iala-aism.org
www.iala-aism.org

International Association of Marine Aids to Navigation and Lighthouse Authorities
Association Internationale de Signalisation Maritime