IHO
International Hydrographic Organization

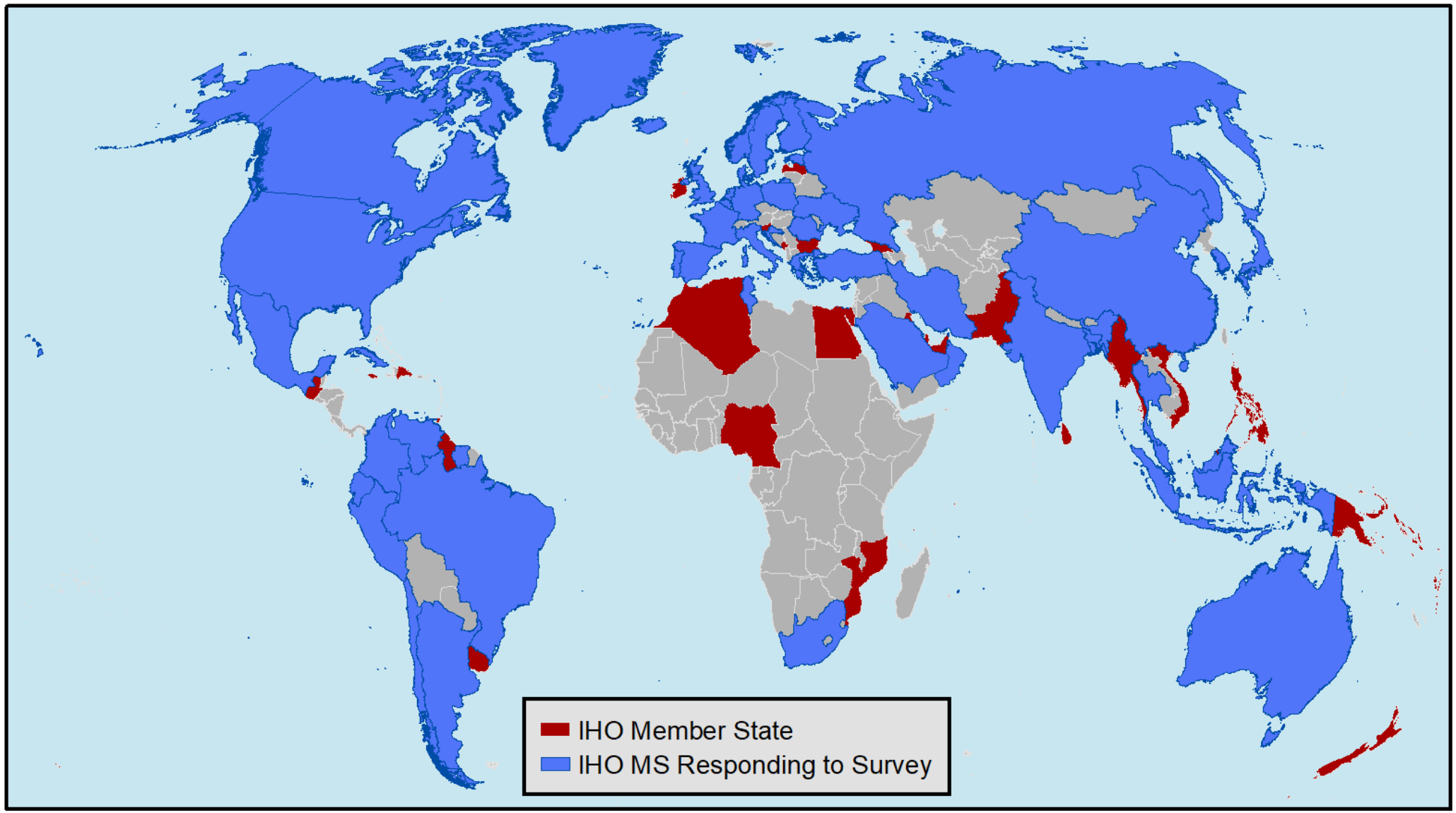
MACHC20
Santo Domingo, Dominican Republic
2-6 December 2019

On the Future of the Paper Nautical Chart

based on reports submitted to the
Nautical Cartography Working Group
NCWG5, Stockholm, Sweden, 5-8 November 2019

Survey of IHO Member States on the future of nautical paper charts

IHO MEMBER STATES RESPONDING TO THE SURVEY

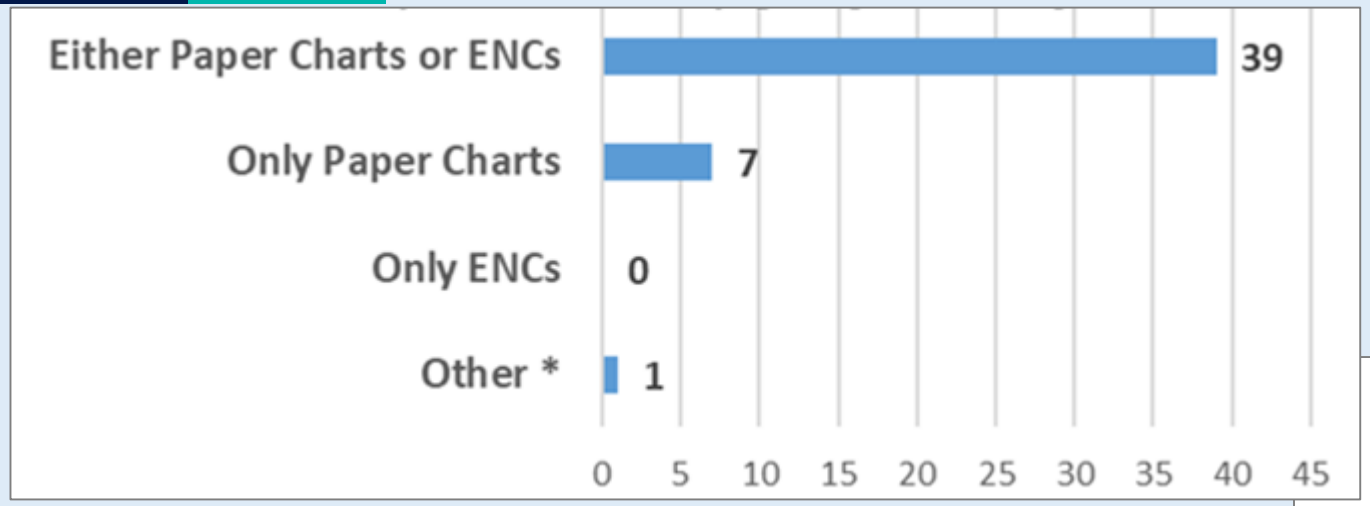


52 IHO MEMBER STATES RESPONDED TO SURVEY

Argentina	Ecuador	Korea (Rep of)	Saudi Arabia[2]
Australia	Estonia	Malaysia	Singapore
Bahrain	Denmark[1]	Malta	South Africa
Bangladesh	Finland	Mauritius	Spain
Belgium	France	Mexico	Suriname
Brazil	Germany	Netherlands	Sweden
Canada	Greece	Norway	Thailand
Chile	Iceland	Oman	Tunisia
China[1]	India	Peru	Turkey
Colombia	Indonesia	Poland	Ukraine
Croatia	Iran	Portugal	United Kingdom
Cuba	Italy	Romania	United States
Cyprus	Japan	Russian Federation	Venezuela

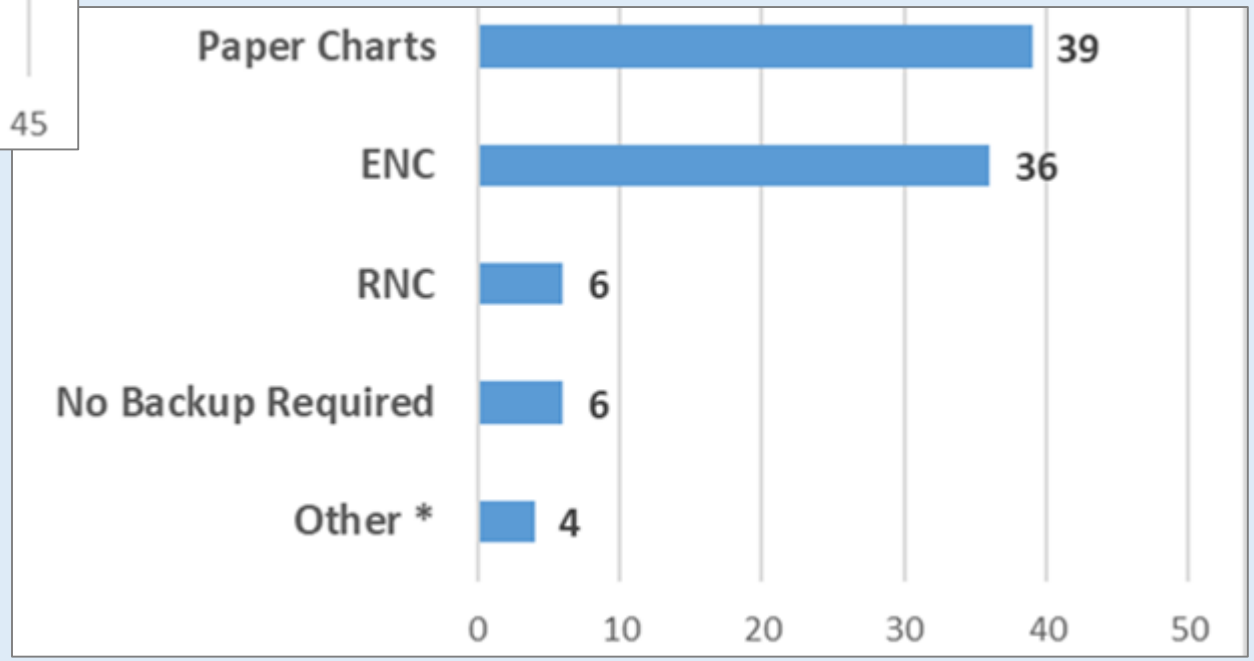
[1] Survey responses from China and Denmark were received too late to incorporate into report to NCWG-5.
[2] Saudi Arabia responded to IHO Circular Letter 29/2019, but abstained from submitting a survey questionnaire.

CARRIAGE REQUIREMENTS FOR DOMESTIC VOYAGES



Primary - Required

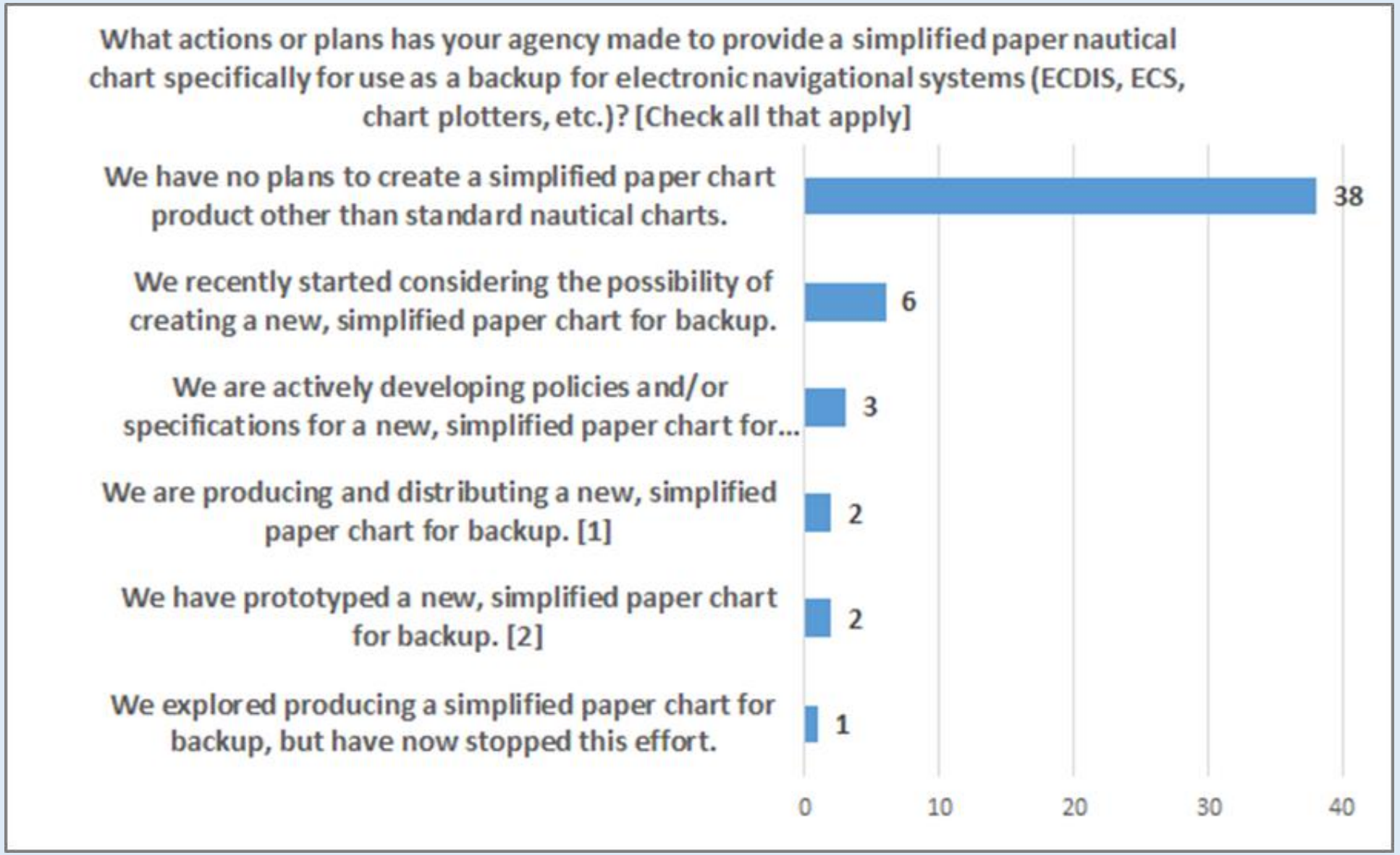
* One member state responded "ENCs *and* Paper Charts."



Backup – Allowed

* Four member states responded “Other” and referred to ECDIS or ECS usage.

PLANS FOR DEVELOPING SIMPLIFIED PAPER CHART AS BACKUP FOR ELECTRONIC SYSTEMS

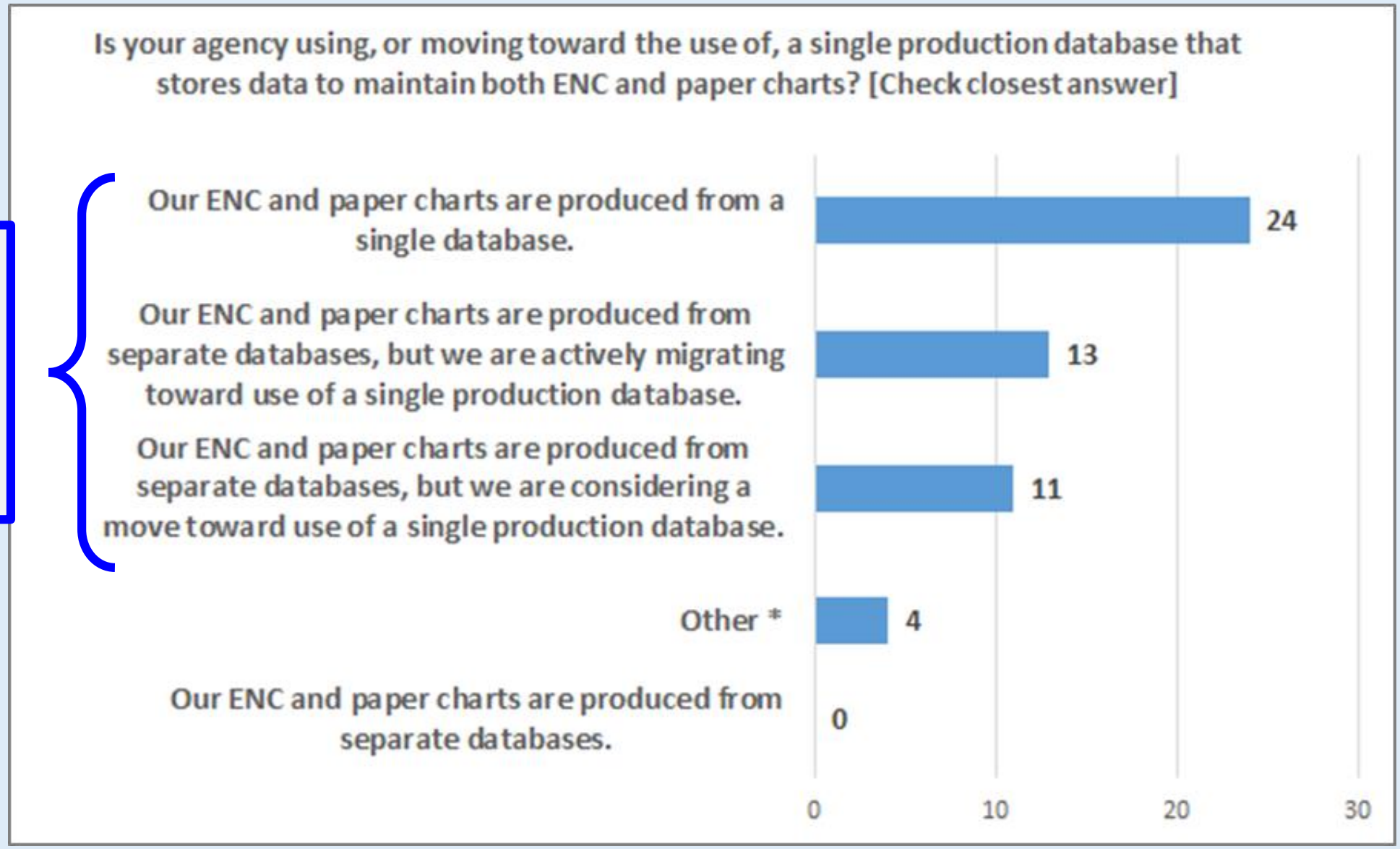


No – 39

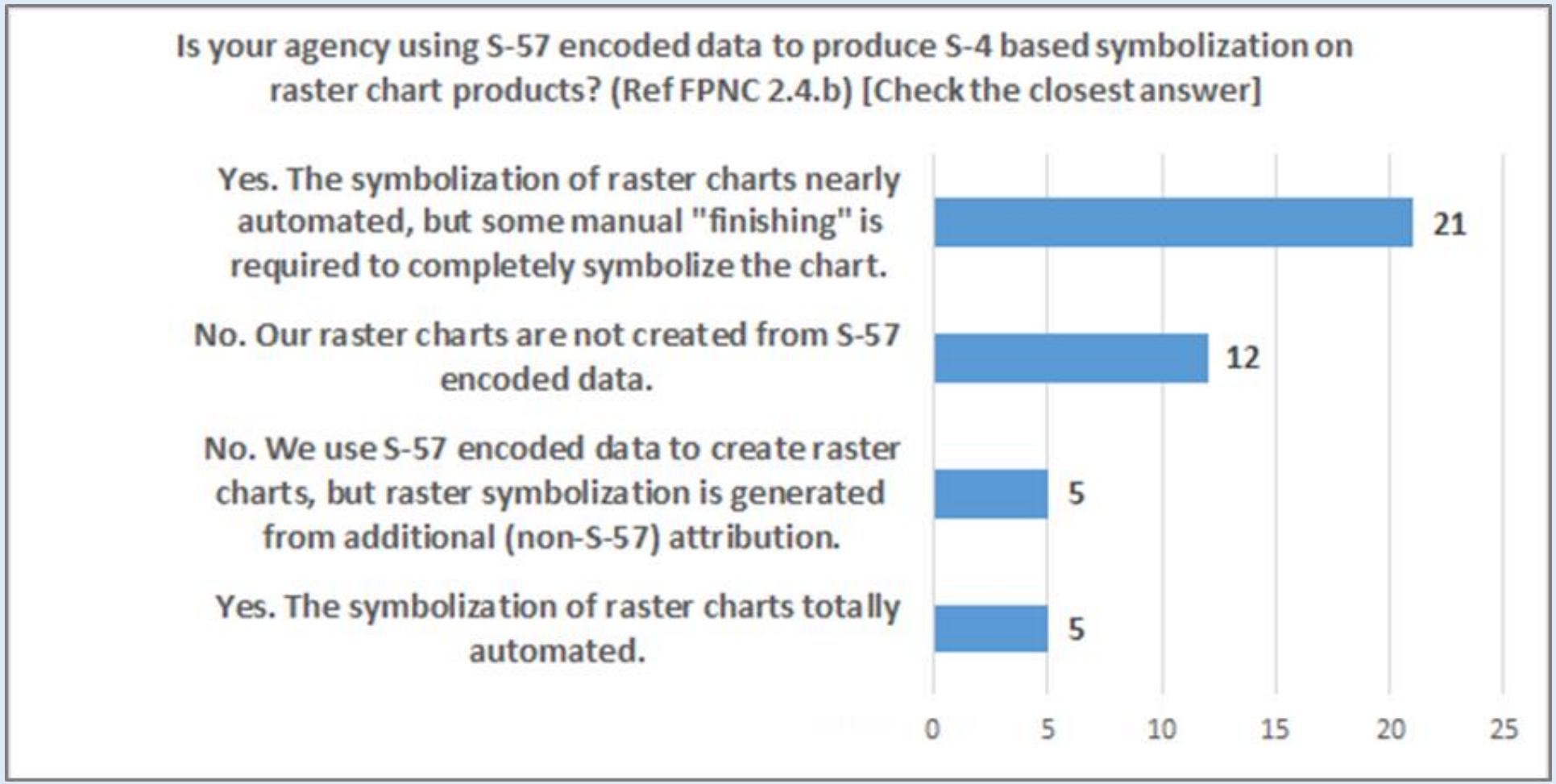
Yes – 13

SINGLE PRODUCTION DATABASE FOR BOTH PAPER - ENC

Have or are moving toward a single database

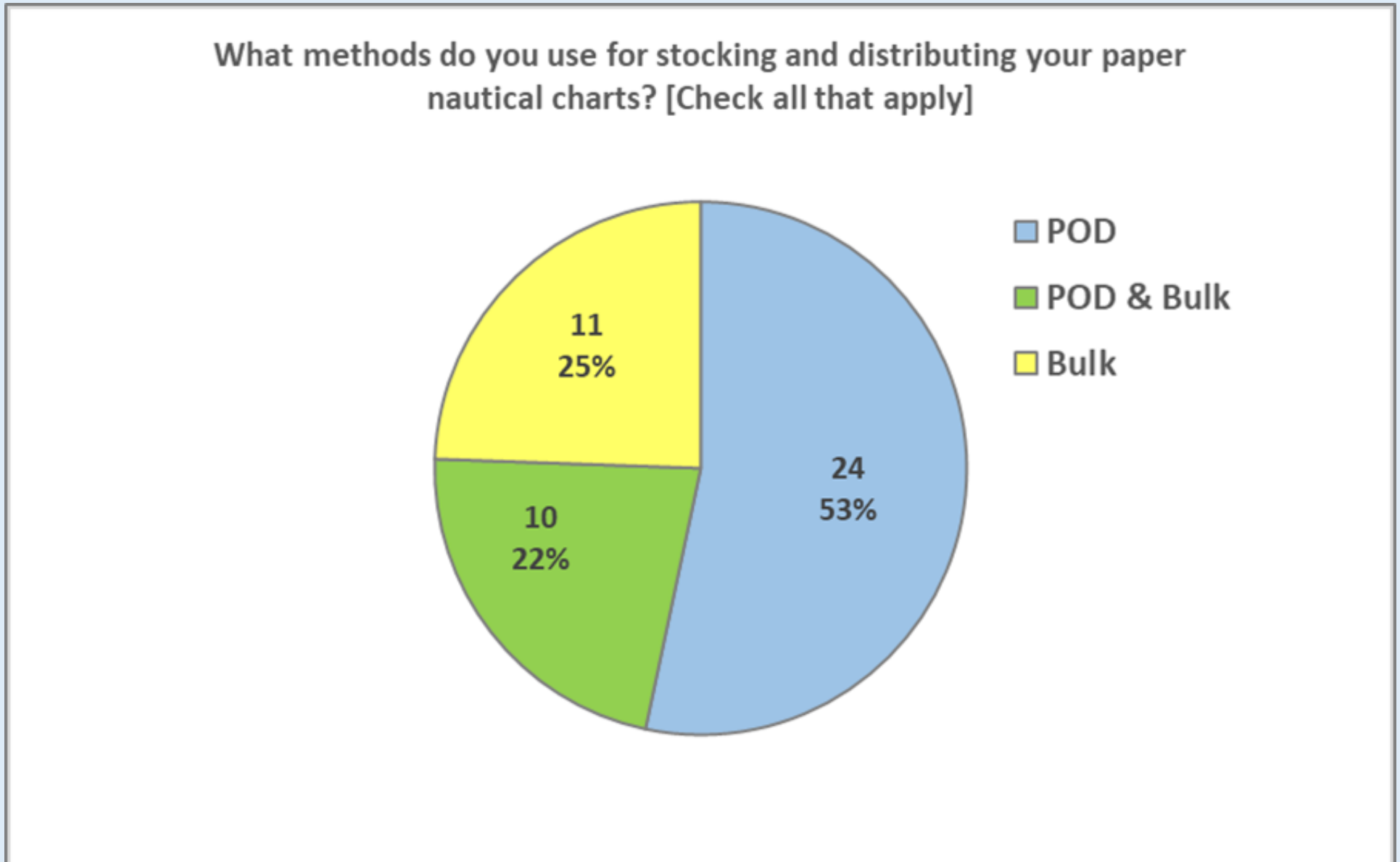


USE S-57 ENCODED DATA TO PRODUCE S-4 SYMBOLS ON RASTER CHARTS

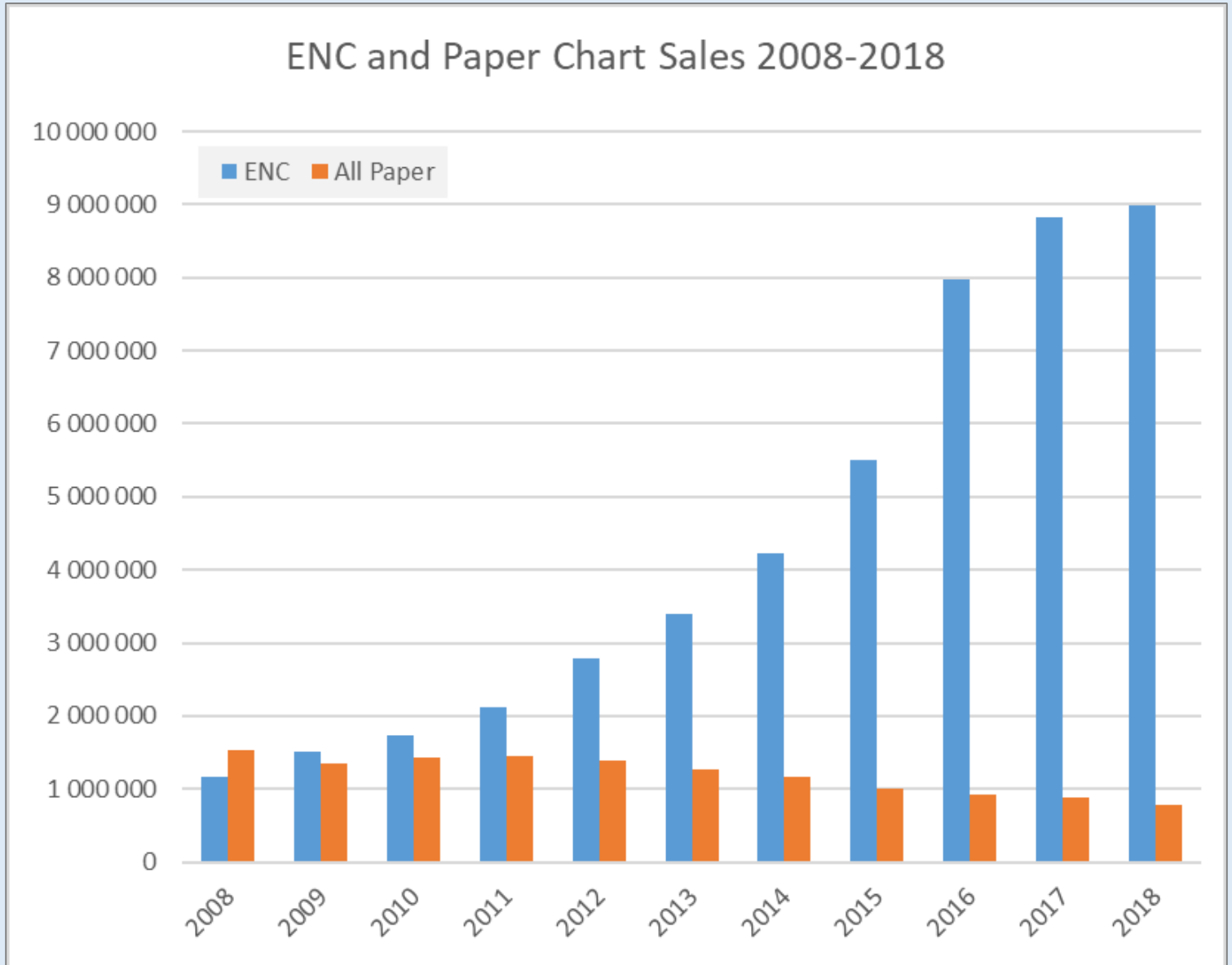


No – 17
Yes – 26

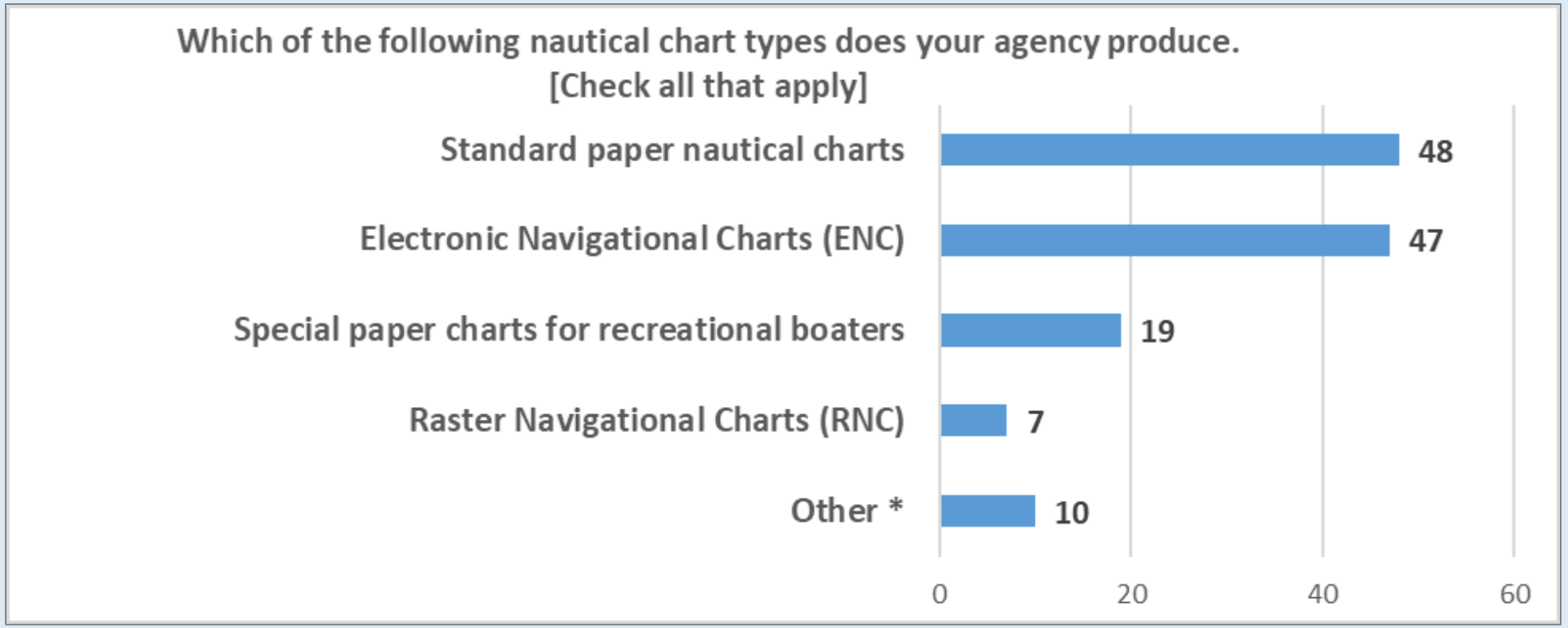
PAPER CHART DISTRIBUTION METHOD BY AGENCY



ENC AND PAPER CHART SALES COMPARED



TYPES OF NAUTICAL CHARTS BEING PRODUCED

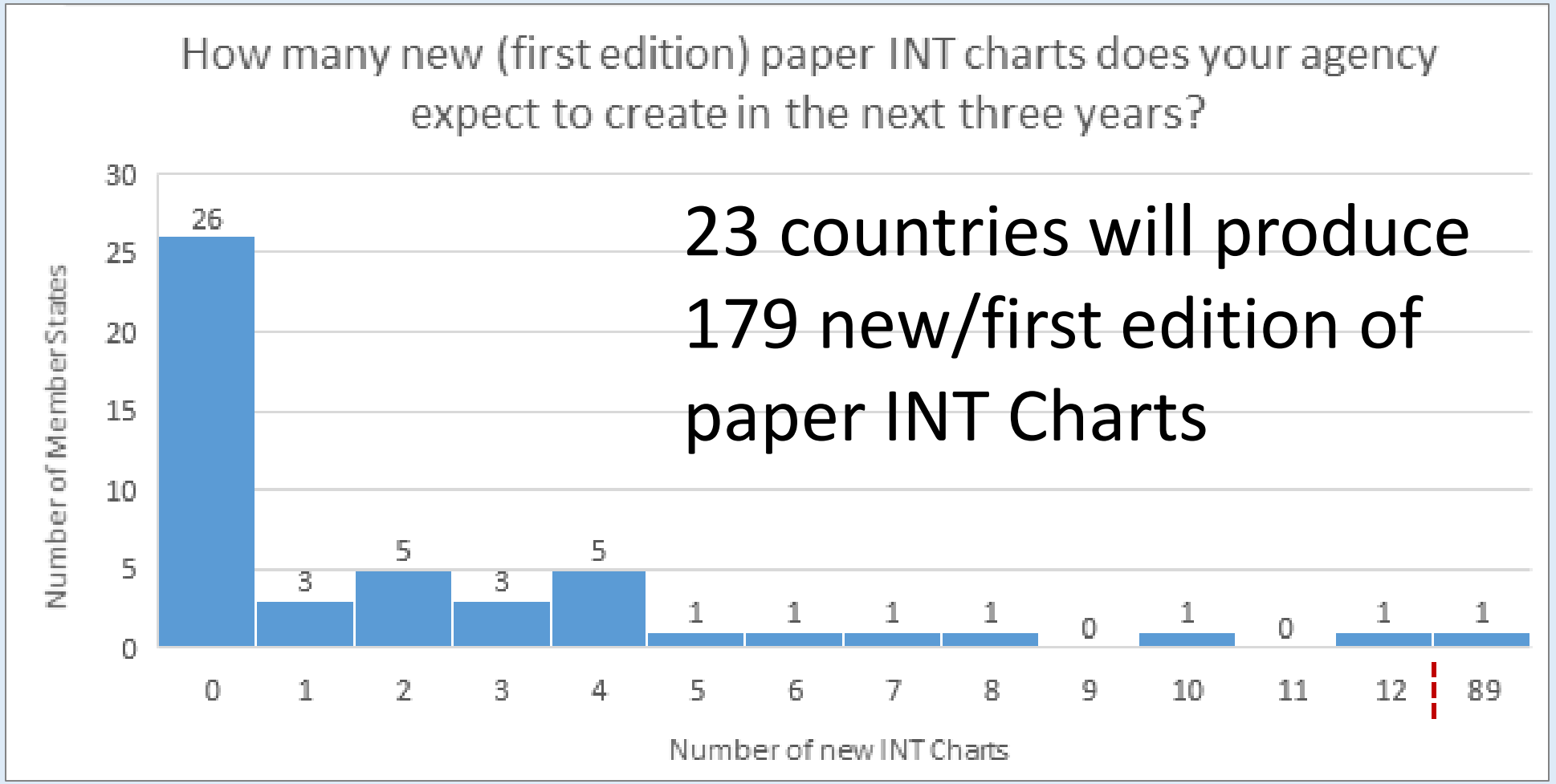


21 COUNTRIES MAINTAINING 55K KM OF INLAND ENC

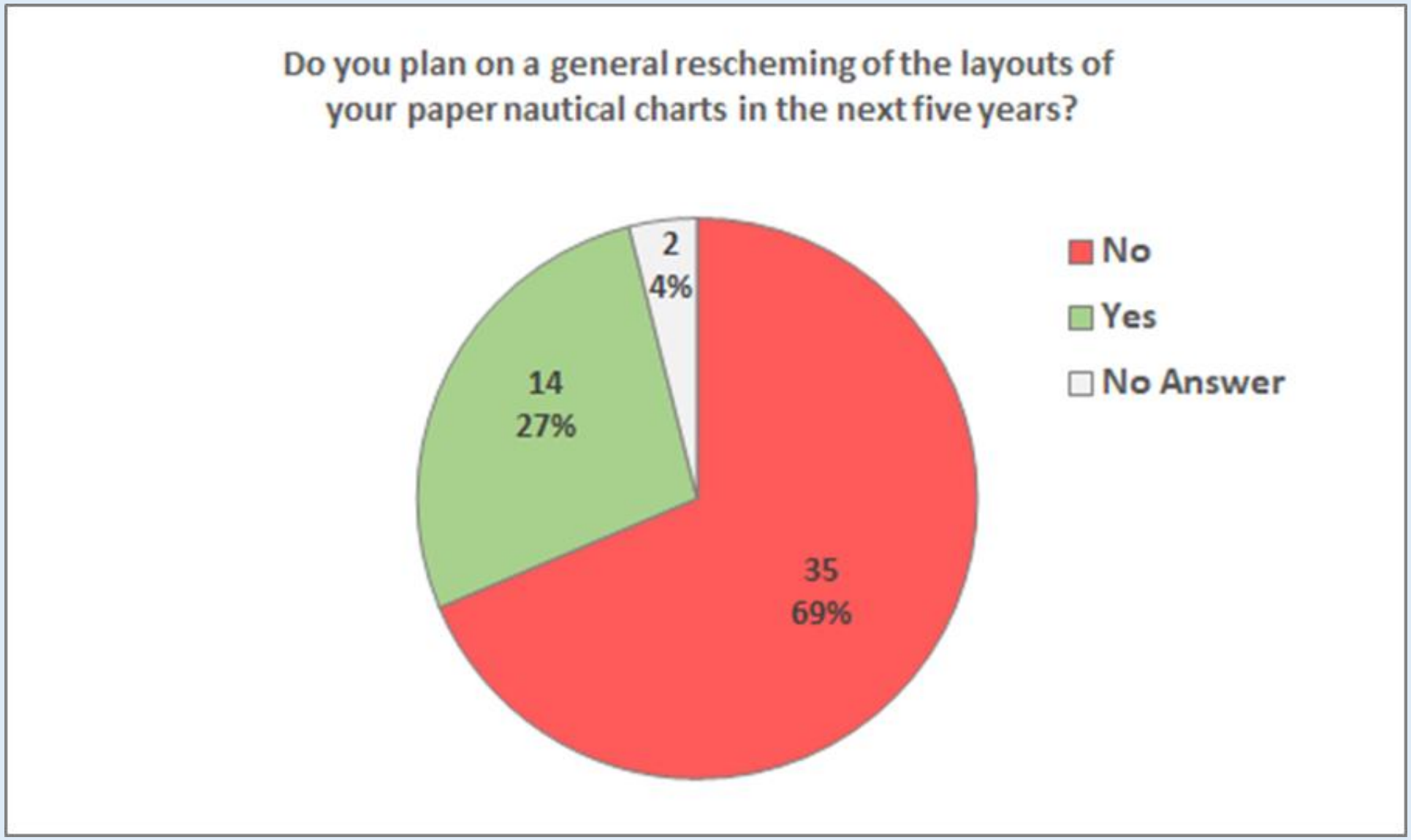
Inland ENC Harmonization Group reports that
55 629 km of iENC coverage has been produced by the countries listed below.

Australia	France	Russian
Belgium	Germany	Federation
Brazil	Hungary	Serbia
Bulgaria	Luxembourg	Slovakia
China	Netherlands	Switzerland
Croatia	Poland	Ukraine
Czech Republic	Romania	United States

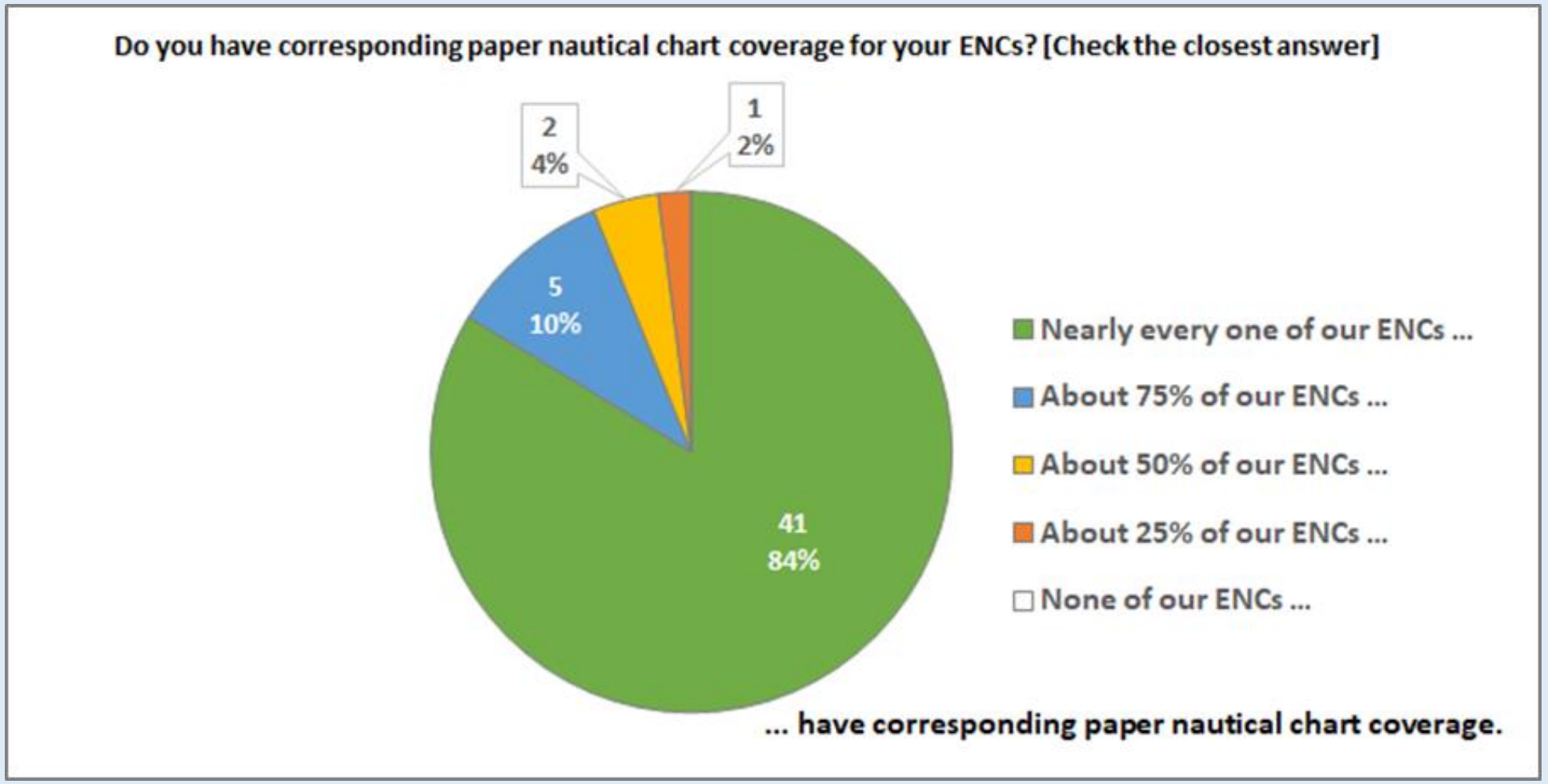
PLANNED INT CHART PRODUCTION



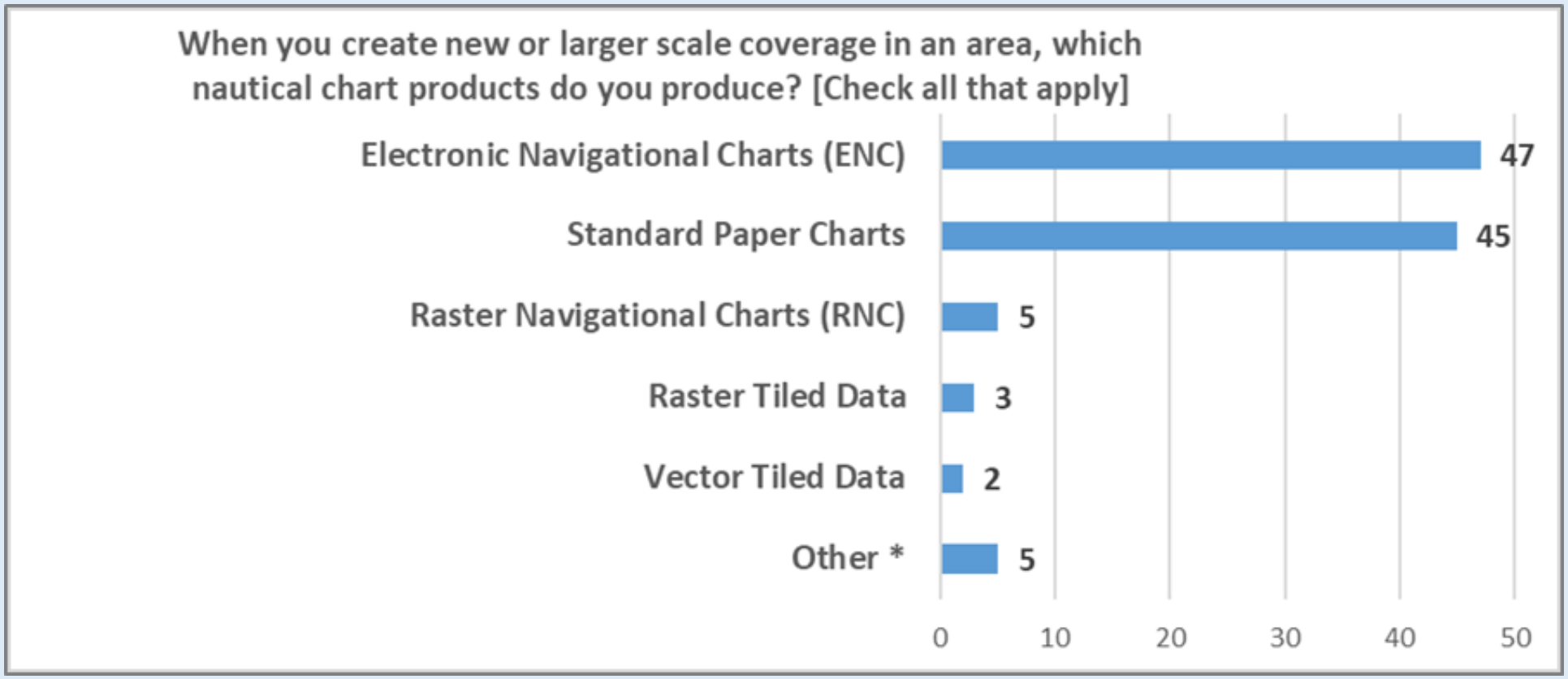
PLANS TO RESCHEME PAPER/RASTER CHARTS



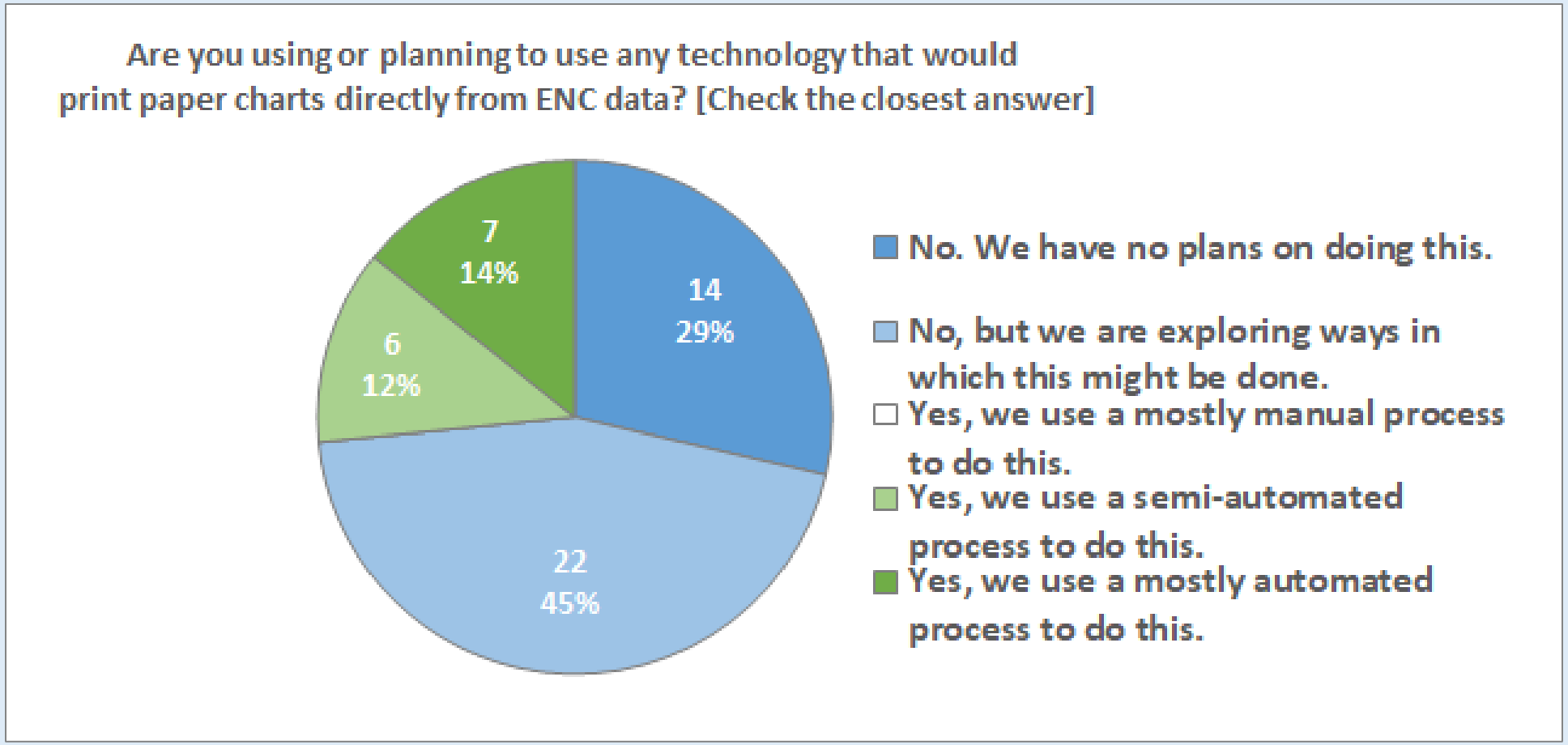
CORRESPONDING PAPER CHART COVERAGE



PRODUCTS CREATED FOR NEW COVERAGE



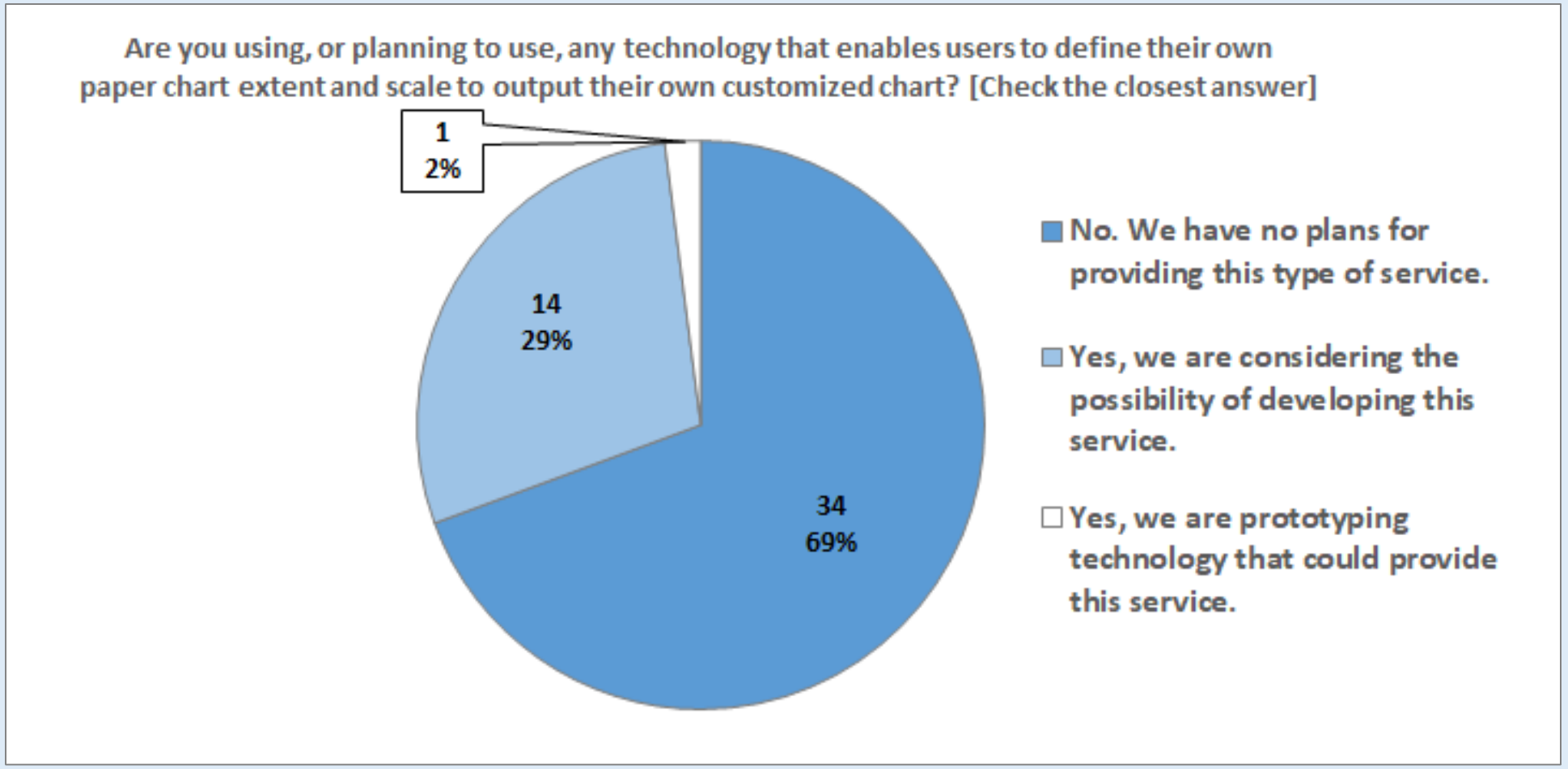
PAPER CHARTS DIRECTLY FROM ENC DATA



29% – No

71% – Yes, in some manner or considering doing so

CUSTOMIZED CHARTS



69% – No

31% – Considering the option or already doing so.

Report of the team on Finalizing the Future of the Paper Nautical Chart

The final report will be submitted to HSSC12 in May 2020

PERCEPTION OF IMPACTS OF A PAPERLESS WORLD

Possible recommendations for activities to be undertaken by NCWG:

1. S-4 Portrayal Catalogue - Implement standard S-4 symbology in an S-100 Portrayal Catalogue for raster paper/charts

2. Freezing S-4 and the S-4 based portions of national INT1 and Chart 1 documents, so that future NCWG efforts can focus exclusively on enhancing the portrayal of S-57 and S-101 ENCs and other S-100 based products.

PERCEPTION OF IMPACTS OF A PAPERLESS WORLD

Possible recommendations for activities to be undertaken by NCWG:

3. Enhance ECDIS Portrayal of ENC for both S-57 and S-101 and help facilitate ways to make the current and future display of ENCs as acceptable to mariners as the presentation on paper charts.

4. Raster from ENC - Develop a standard means of generating raster nautical charts from ENC data.

5. Backup Chart Specification - Develop a specification for – or general guidelines for – a simplified paper/raster chart that would be suitable as a back-up for ECDIS and ECS.

PERCEPTION OF IMPACTS OF A PAPERLESS WORLD

Possible recommendations for activities to be undertaken by NCWG:

6. Chart on Demand / Custom Chart – Coordinate efforts of various HOs that are developing online "Chart on Demand" or bespoke "Custom Chart" capabilities

7. INT Chart Production and Coordination – What, if any, recommendations does NCWG want to make regarding the future of production or INT charts and coordination efforts related to INT charts or ENC within ICCWGs? Does it make sense to freeze INT Charts Schemes for instance. If yes, what is the impact on S-11?

PERCEPTION OF IMPACTS OF A PAPERLESS WORLD

Possible recommendations for activities to be undertaken by NCWG:

8. Minimum Paper Chart Standard - Develop a new “minimum” standard for Paper Chart Production derived from Chart Content Databases (also used for ENC Production), meeting functional requirements and regulatory obligations (SOLAS back-up for instance, but not only, national as well).

Food for thought

PERCEPTION OF IMPACTS OF A PAPERLESS WORLD

What are your national needs as a producer?

What do your customers and users need?

What are the legal aspects?

Why to change your national framework?

What are the needs for international voyages?

Why to participate in the discussions?

IHO

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Thank you!