

ADECS Underwater Defence Technology Asia 2020

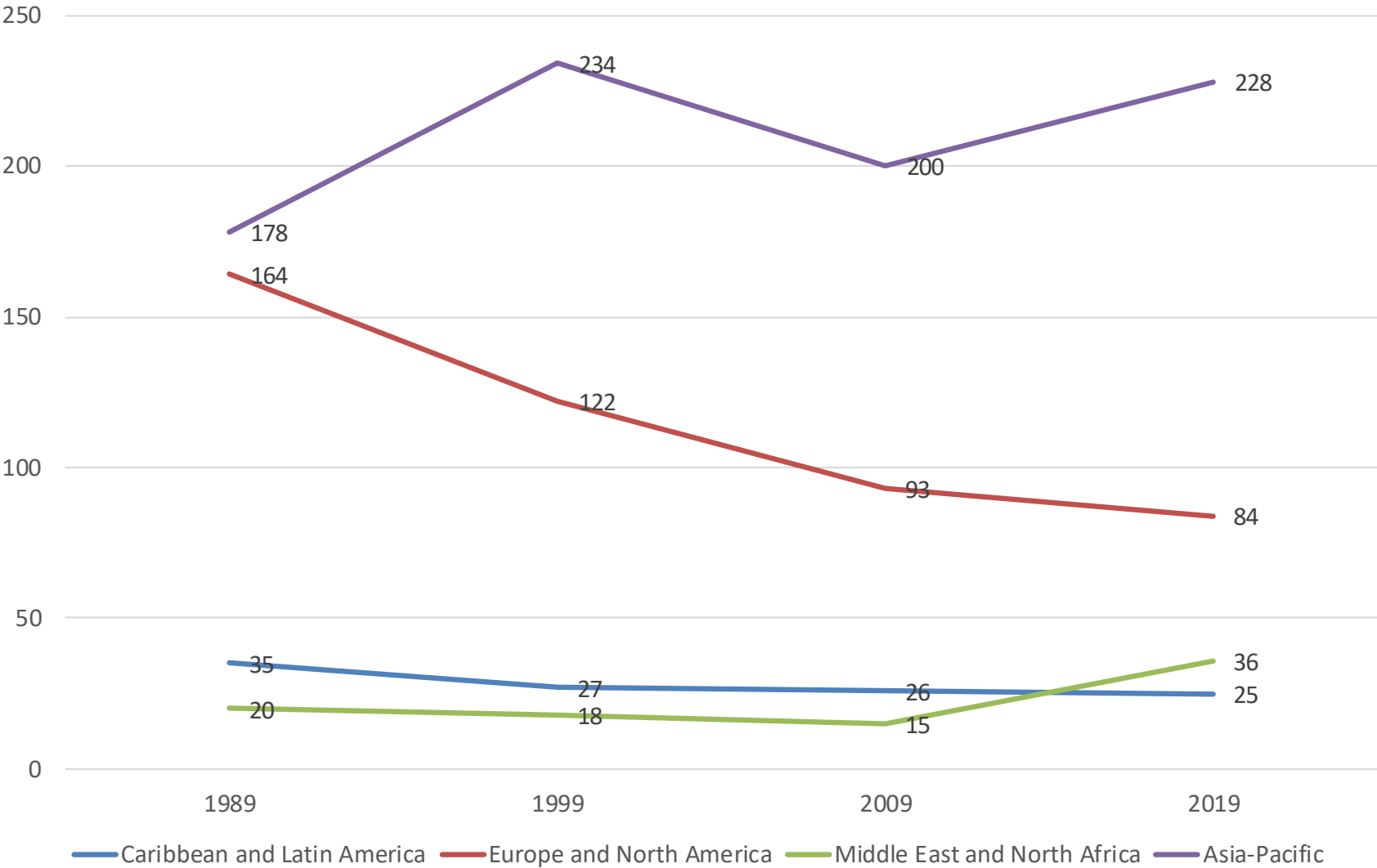
Submarine Proliferation - A Regional Overview

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*4 February 2020
Singapore*

Submarine Proliferation: Regional Comparison



Source: IISS *Military Balance* corroborated with other sources.



Rise of lower-tier submarine builders also enables submarine proliferation

Submarine Proliferation: Tonnage Comparison

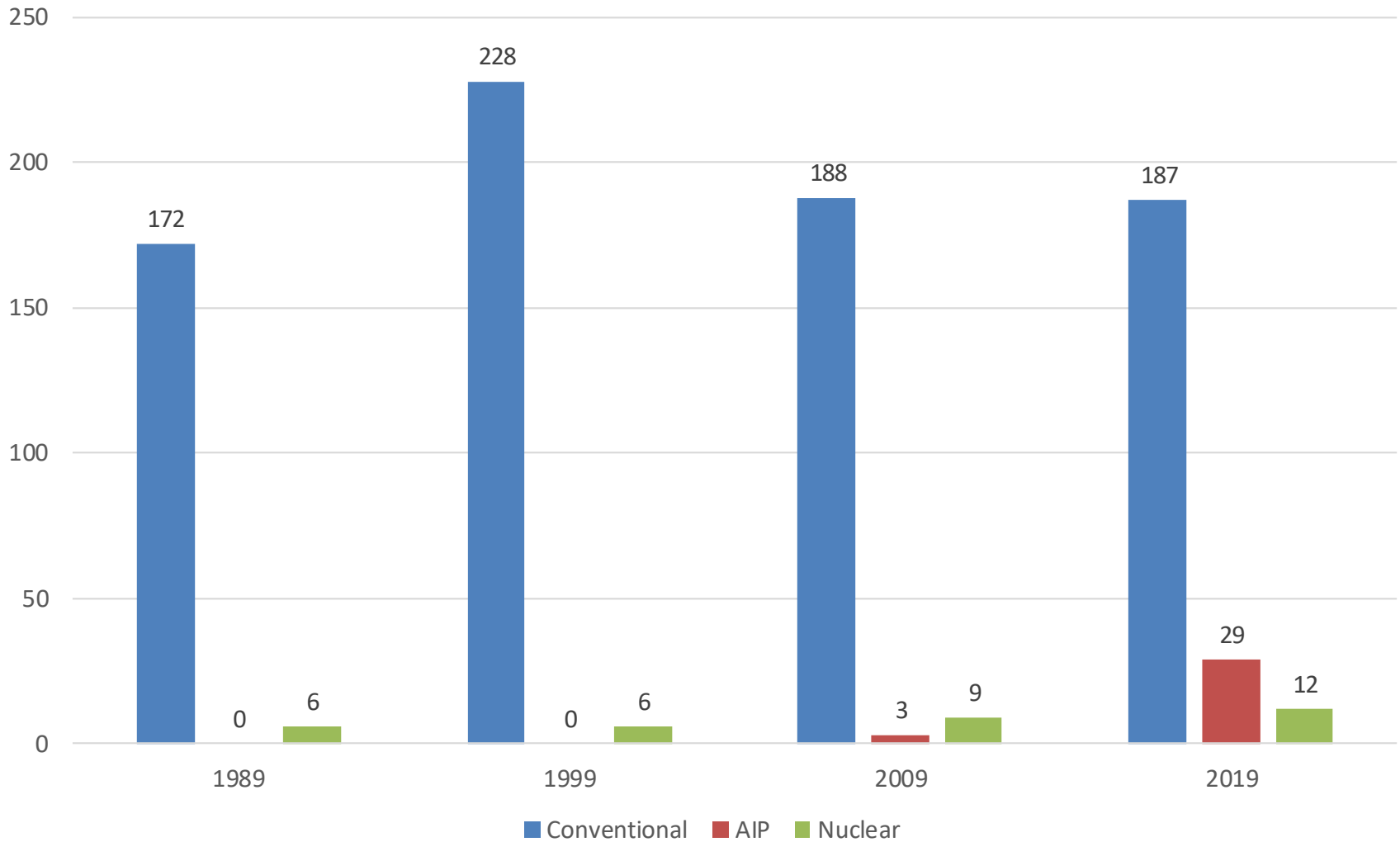
Sub. Displ (ton)	1989	1999	2009	2019
>3500	11	22	44	71
3000-3500	6	11	12	11
2500-3000	20	12	4	2
2000-2500	11	21	38	30
1500-2000	118	80	41	33
1000-1500	6	14	13	18
<1000	6	74	48	63

Source: IISS *Military Balance* corroborated with other sources.

Capability Trends

- Better quieting (anti-sonar anechoic tiles, internal acoustic-suppression)
- Better submerged endurance (AIP, fuel-cell, Li-ion battery)
- Better combat systems (i.e. sensors and weapons control)
- Better standoff weapon capabilities (long-range anti-ship cruise missiles and SLCMs)

Submarine Proliferation: Propulsion Comparison



Source: IISS *Military Balance* corroborated with other sources.

Expeditionary Force Projection



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Vietnam People's Navy *Kilo*-class submarine firing Klub SLCM.

Video: <https://vndata.blogspot.sg/2018/01/vietnam-kilo-class-submarine-launches.html> (from -0.27 onwards)



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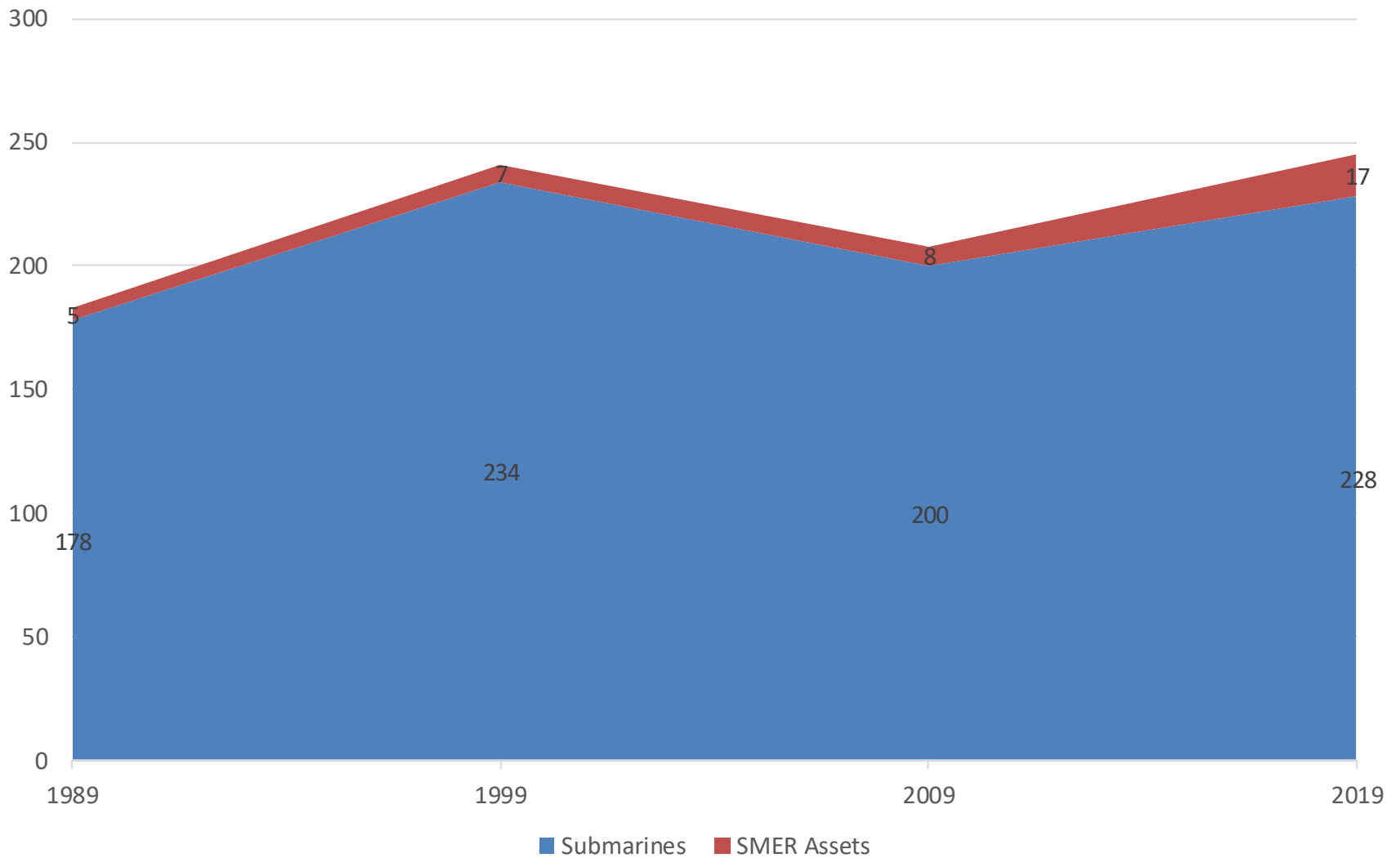
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Other Forms of Proliferation

Submarine Emergency Response (SMER) Capabilities



Source: IISS *Military Balance* corroborated with other sources.

Final Thoughts





Thank you!