NEW FRONTIERS OF OPPORTUNITIES

Evolution of Space Ecosystem

SES
beyond frontiers

PRESENTER
Karim Michel SABBAGH
16 November 2017

Kardashev Scale

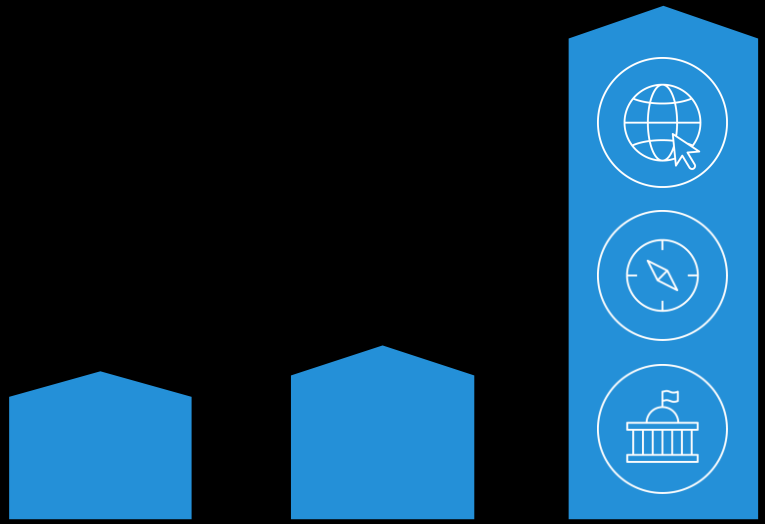
Classifying Civilisations

0.7

Mankind today

Space Sector

Today vs Tomorrow



323B $
2015

329B $
2016

1,1T $
2040

Internet Traffic

At the Dawn of a Data Boom

Global IP traffic from 2010-2040

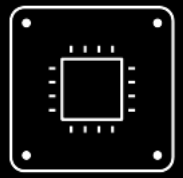
~20% CAGR

5+ zettabytes/month in 2040

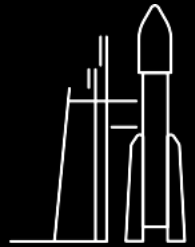
Enablers of Exponential Growth

Overview

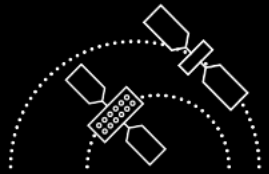
ENERGY



TECHNOLOGY



ACCESS TO SPACE

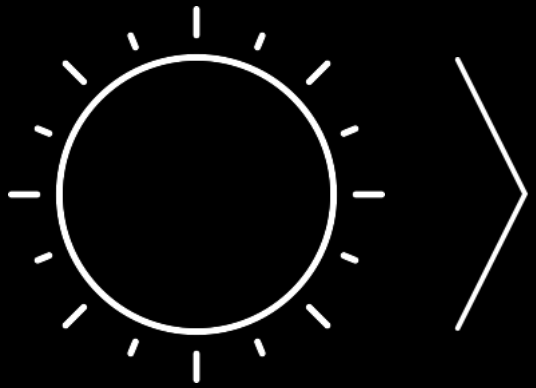


PRESENCE

ECONOMICS

1st Enabler: Energy (1/2)

Most Powerful Resource Available



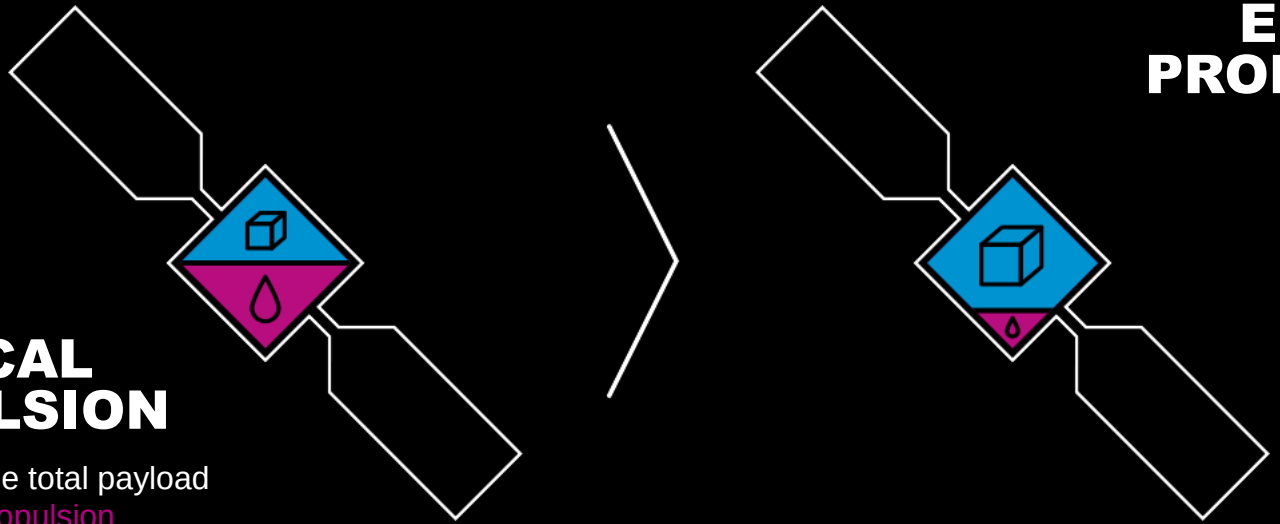
SOLAR ENERGY

= 200 billion

liters of gasoline per minute

1st Enabler: Energy (2/2)

SES Electric Propulsion Satellites



CHEMICAL PROPULSION

up to 50% of the total payload is wasted for propulsion

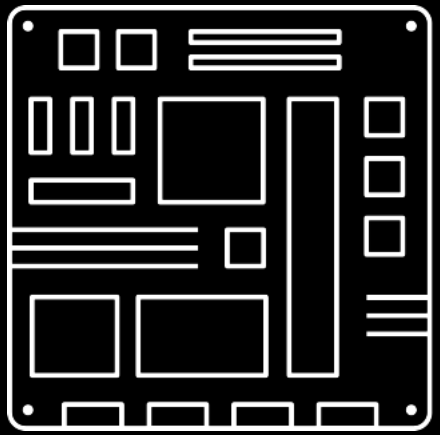
ELECTRIC PROPULSION

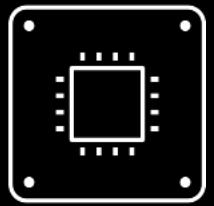
provides flexibility for the payload

2nd Enabler: Technology (1/2)

Analog Satellites vs DSPs

TRADITIONAL PAYLOAD ARCHITECTURE

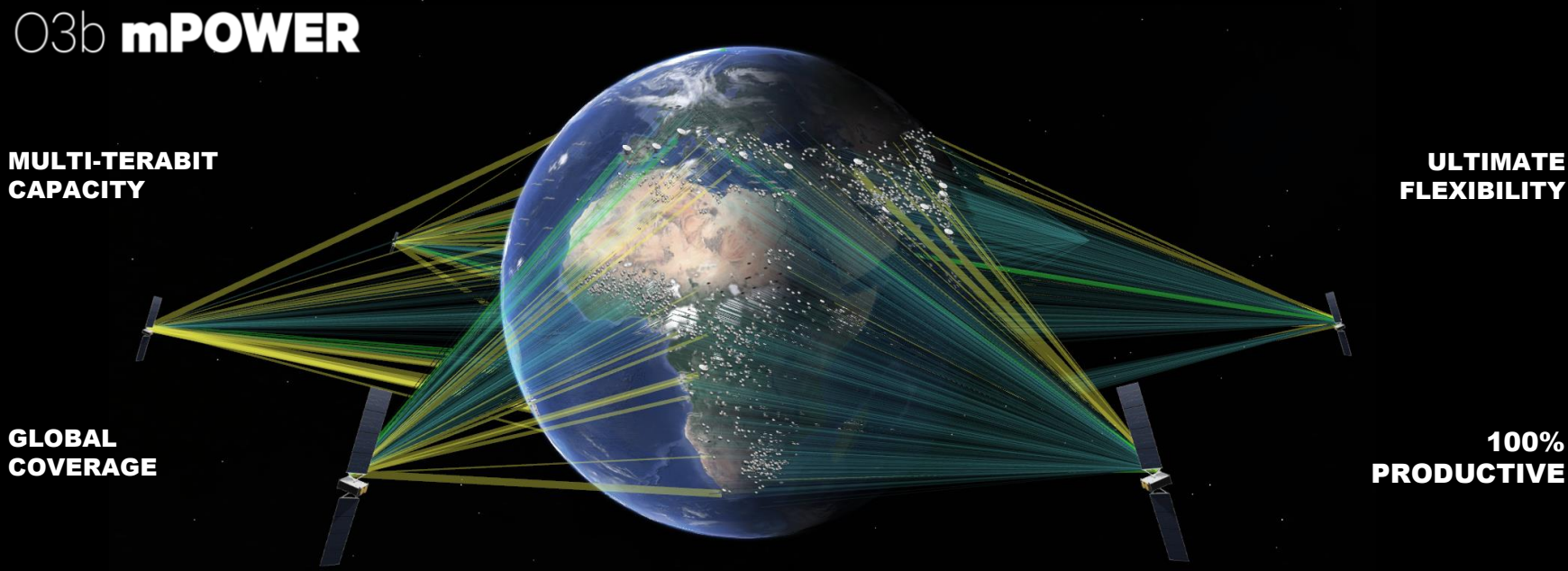




FULLY DIGITISED SATELLITE PAYLOAD

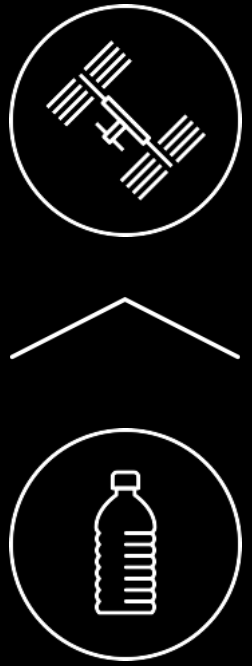
2nd Enabler: Technology (2/2)

GEONext and O3b mPOWER



3rd Enabler: Access to space (1/2)

Improving the Fundamental Economics



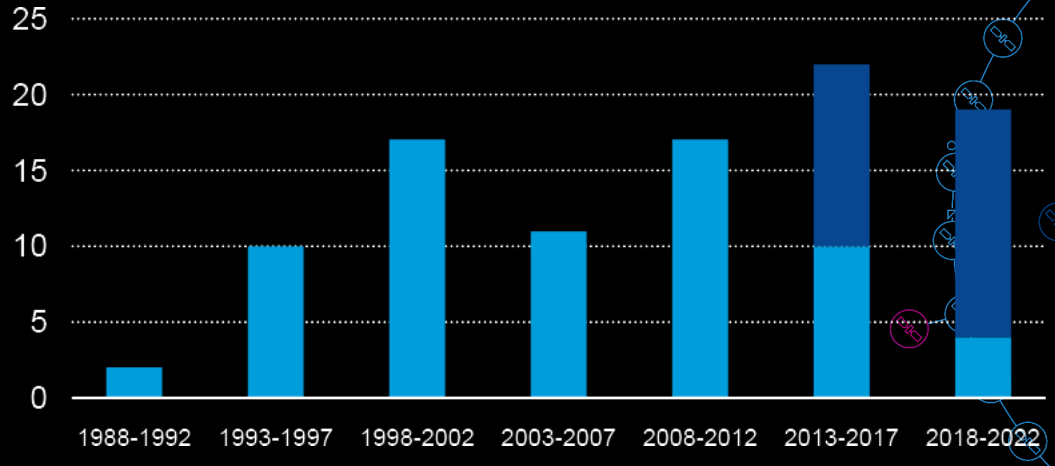
$10,000 +

3rd Enabler: Access to space (2/2)

Promoting Reusability

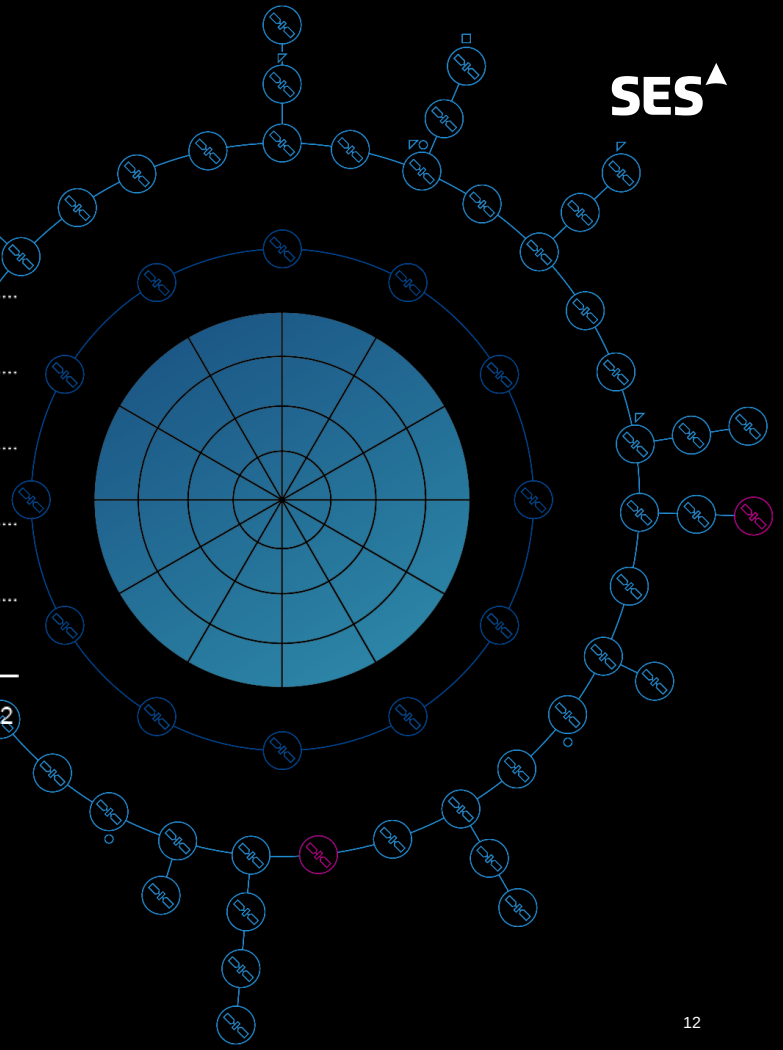
4th Enabler: Presence (1/2)

A Growing Population in Orbit



# of GEO satellites launched

# of MEO satellites launched

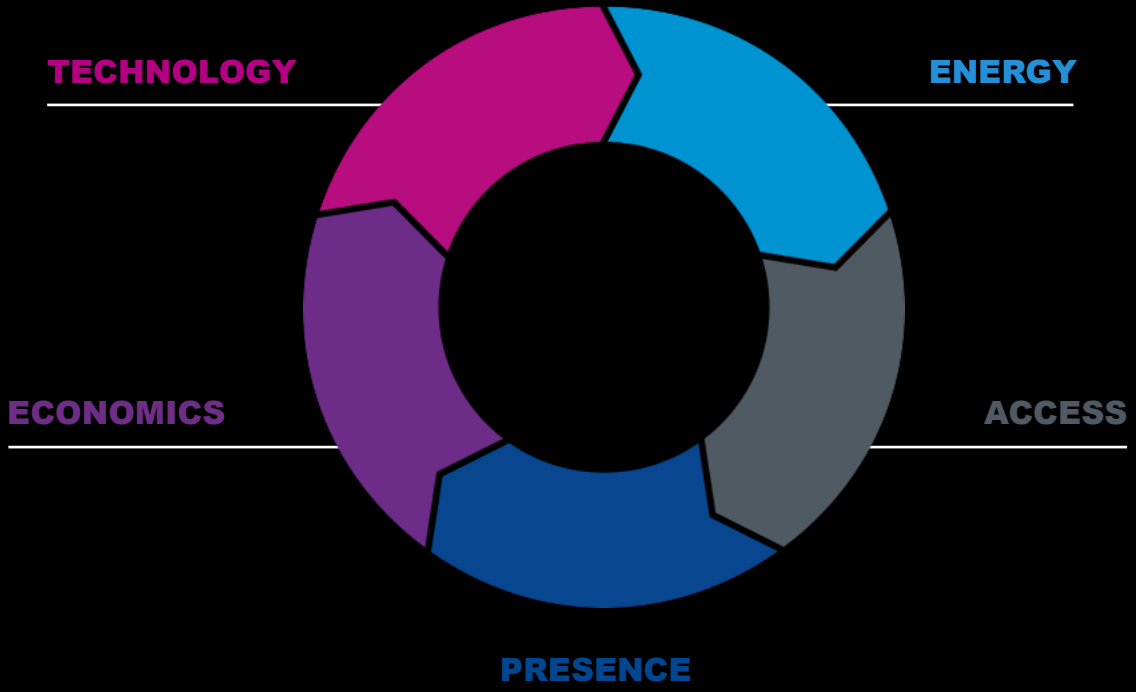


4th Enabler: Presence (2/2)

Working in Space

5th Enabler: Economics (1/2)

Creating a Sustainable Business Case

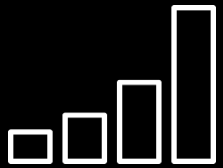


5th Enabler: Economics (2/2)

Most Powerful Satellite System Ever

O3b mPOWER

CAPACITY



Multi-terabit

Scalable to 10s of Tbps globally

FLEXIBILITY

Shape, moderate, route, shift & switch

4,000+

beams per satellite

COVERAGE

400M

Square kilometres covered

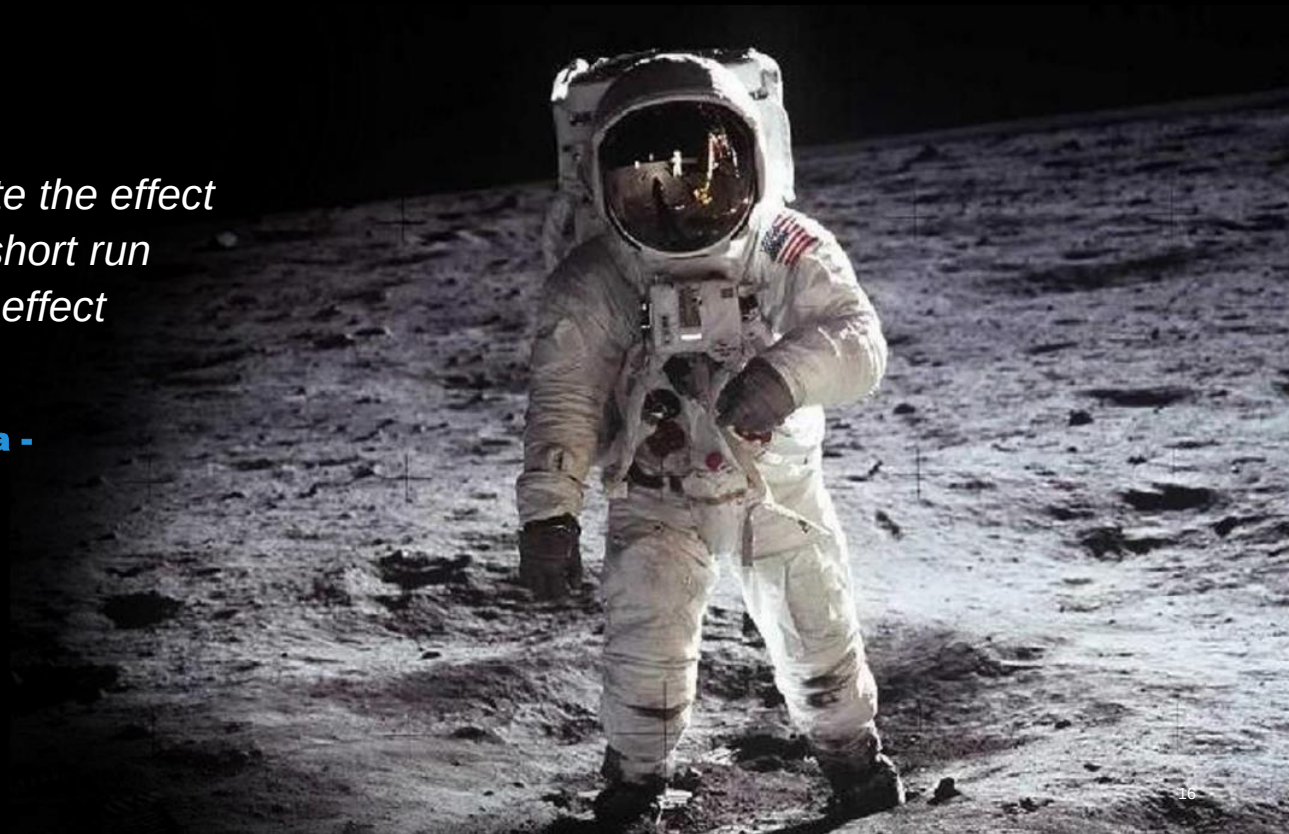
PRODUCTIVITY

100% productive

Beams go to customers, not empty territory

Looking forward

Roy Amara’s Law

We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run

- Roy Amara -