

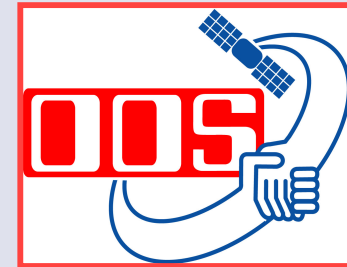
Space Ventures
Business Partners
Equity Finance
Global Links



Member



Equity Investors &



***European Conference on On-Orbit Satellite Servicing and Active Debris Removal:
Exploring Commercial, Legal, and Policy Implications***

30 October 2012- Brussels – Belgium

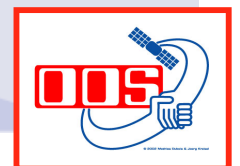
by

J. Kreisel - JKIC - Germany - E-Mail: jk@JKIC.de



S-0

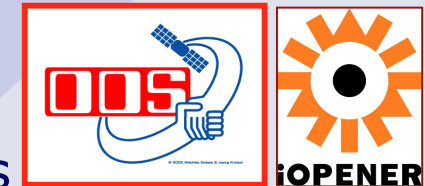
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“JKIC” in Brief ...

Featured in
“The Faces of Space”

- **Focus on Space Commercialization Since 1987**
- **Space & Venture Capital Background**
- **Activities & Services**



- ❑ Advice & Consultancy & Intermediary Services

- Space Commercialization
- Strategy Development
- International Collaboration
- Education & Training

Member



- ❑ Hands-On Coaching of Commercial Ventures
- ❑ Financial Services (Early-Stage Focus)

- **Partners & Customers Worldwide**

- ❑ Space Agencies & International Organizations
- ❑ Space & Non-Space Industry & Entrepreneurs
- ❑ Selected Investors

- **Proprietary Global Network of Leading Expertise**
- **Independent, Different, Special ... Partner!**

- **Space Ventures**
- **Equity Finance**
- **Business Partners**
- **Global Links**



“On-Orbit Servicing” (OOS)

- **OOS Is NOT an End Itself**
- **OOS ≠ Only One Solution**
- **Too Early to Judge**

Definitions, Nomenclature & Branding?

“Space-to-Space”

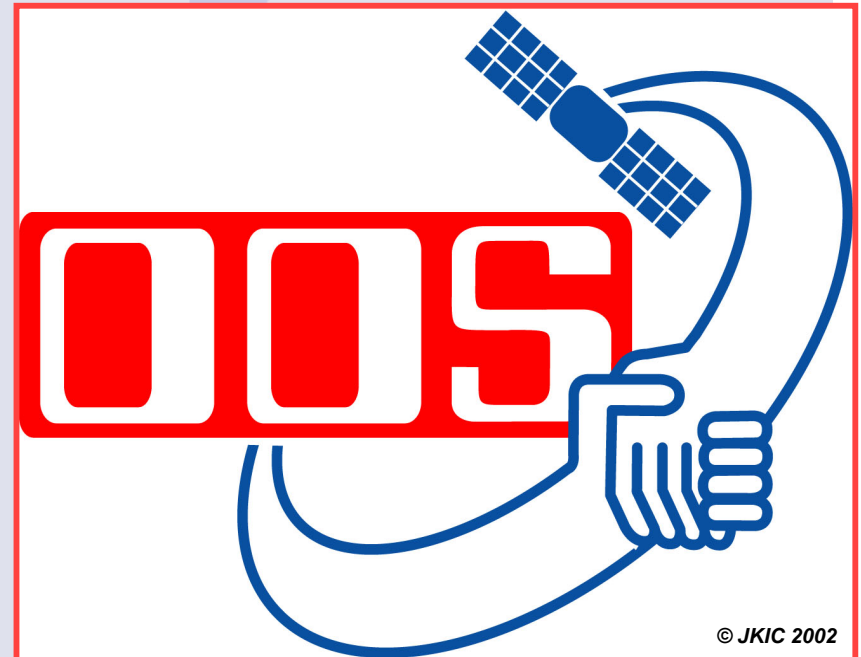
New Partnerships “S2S”

▪ What for?

- Fix Problems**
- Upgrade Systems**
- Increase Mission Flexibility**
- Enable for Entirely New Missions**

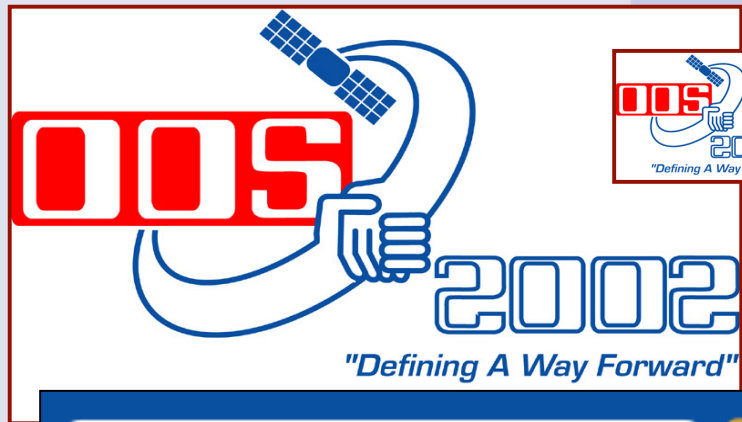
On-Orbit Assembly (OOA)

Active Debris Removal (ADR)



Is there a Market for OOS? YES, Near-Term: Life Extension!

A Decade Ago: International Workshops & More



1st bilateral DLR-CSA WORKSHOP on
On-Orbit Servicing of Space Infrastructure Elements
via Automation & Robotics Technologies

25-26 November 2002
DLR, Cologne Area, Germany



see: www.on-orbit-servicing.com



WORKSHOP on
On-Orbit Servicing of Space Infrastructure Elements
Via Automation & Robotics Technologies

1-2 October 2004
Vancouver - Canada



© 2002 Mission Design & Jerry Krueger

Organized by

GOLD SPONSORS

orbital recovery corporation

EMDRobotics

a MacDonald's Debitel company

Dutch Space

K

KATANA-1000

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TRANSACT

INTECH

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Optech

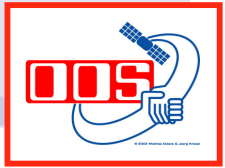
neptec

Focus: Commerce

- 150 Participants
- 20 Countries

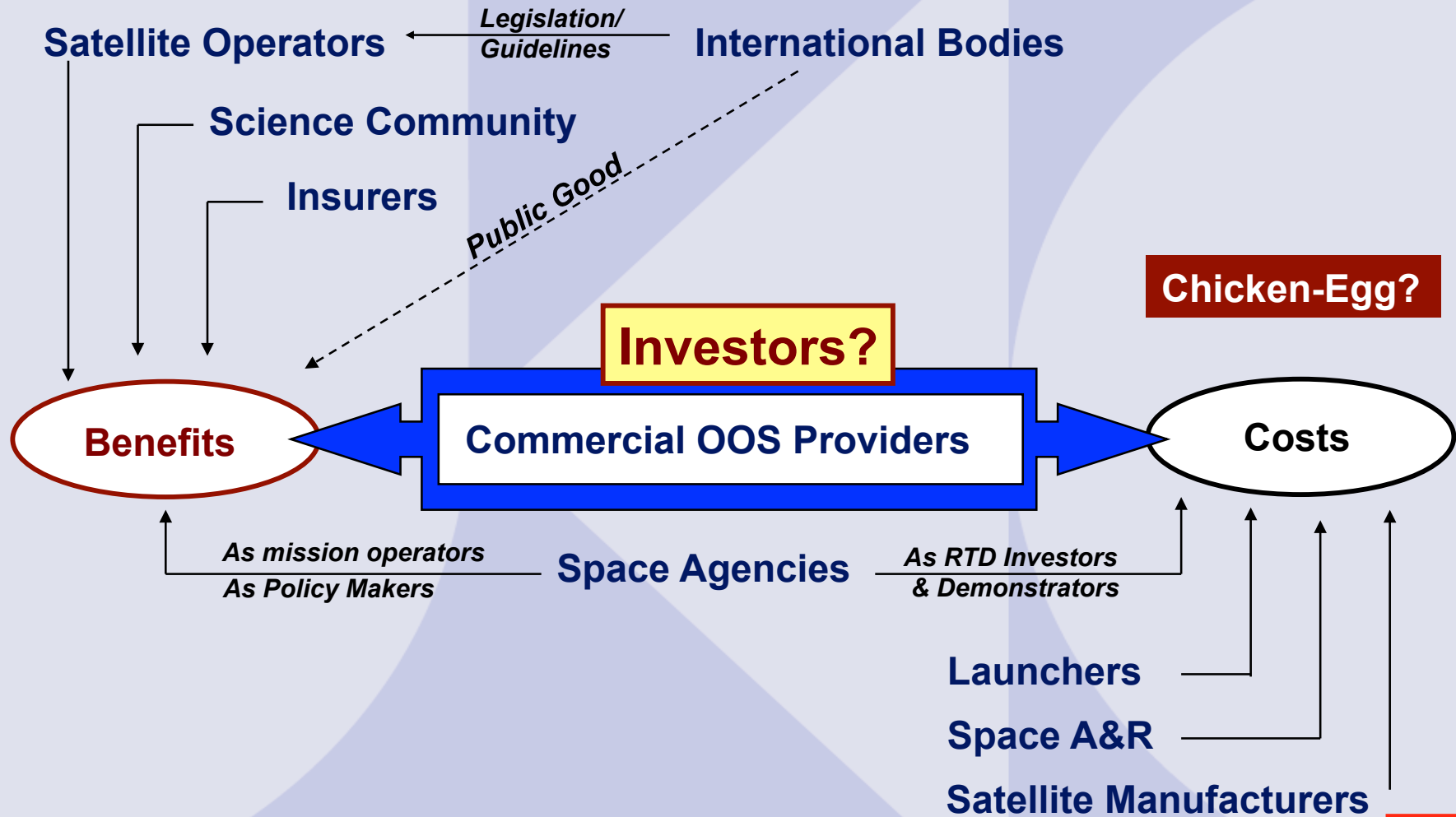
**DLR licensed its
Capture Tool to
Orbital Recovery**

Lots of Hope!

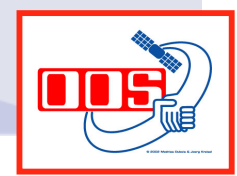


OOS Stakeholders

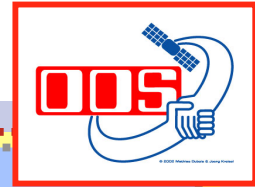
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Where Is the Market Equilibrium?



The "OOS Eco-System"

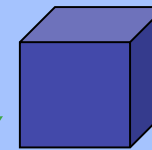


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Environment

- Political
- Legal
- Regulatory
- ...

In-Orbit Infrastructure

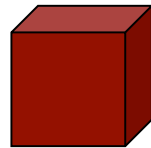


- A&R
- IP
- Wireless
- Nano
- ...

Business & Economics

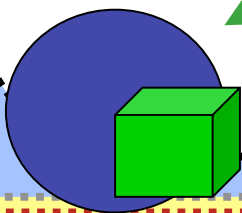
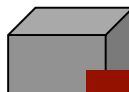
- Value Proposition
- Business Model
- Partnerships
- Jurisdictions
- Risk Management
- Finance

Services, etc.



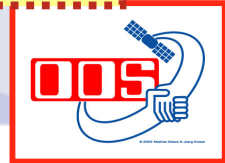
- Staging Orbits
- OOS
- OOA
- ...

Mission Architecture & Logistics

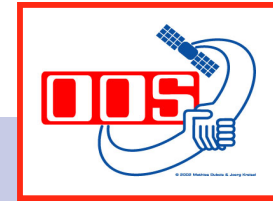


G/S

A System & "Business Engineering" Challenge



OOS Stakeholder Benefits (Simplified)



**YES + NO
Camps!**

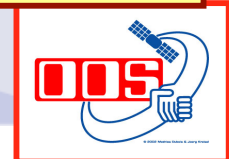
Commercial Satellite Operators	<ul style="list-style-type: none"> • Profit (Revenues!) – Seamlessness • Deferred CAPEX
Insurance Companies	<ul style="list-style-type: none"> • Risk Reduction • Premium Policy & Market
Satellite Manufacturers	<ul style="list-style-type: none"> • Design Feedback • Servicer Production/Economy of Scale • Co-Operative Satellite Design
Space Agencies	<ul style="list-style-type: none"> • Demonstration in Space • Space Infrastructure Development • Commercialization
Governments	<ul style="list-style-type: none"> • Knowledge Base • Budget Efficiency & Economic Growth
Science Community	<ul style="list-style-type: none"> • Safeguarding Projects
Launch Service Providers	<ul style="list-style-type: none"> • No. & Frequency of Launches
Space A&R Community	<ul style="list-style-type: none"> • Various
Intl. & Regulatory Bodies	<ul style="list-style-type: none"> • Debris, Orbital Clean-Up, Frequency
Suppliers	<ul style="list-style-type: none"> • Innovation & Standardization • Economy of Scale

Hard Factors

- Market
- Budget/Profit
- Cost-Benefit
- Structures
- Processes
- Technology
- Demonstration

Soft Factors

- Culture
- Mindset
- Psychology



Trust Building: "Realism vs. Dreams"



New Aircraft



Mars Landing

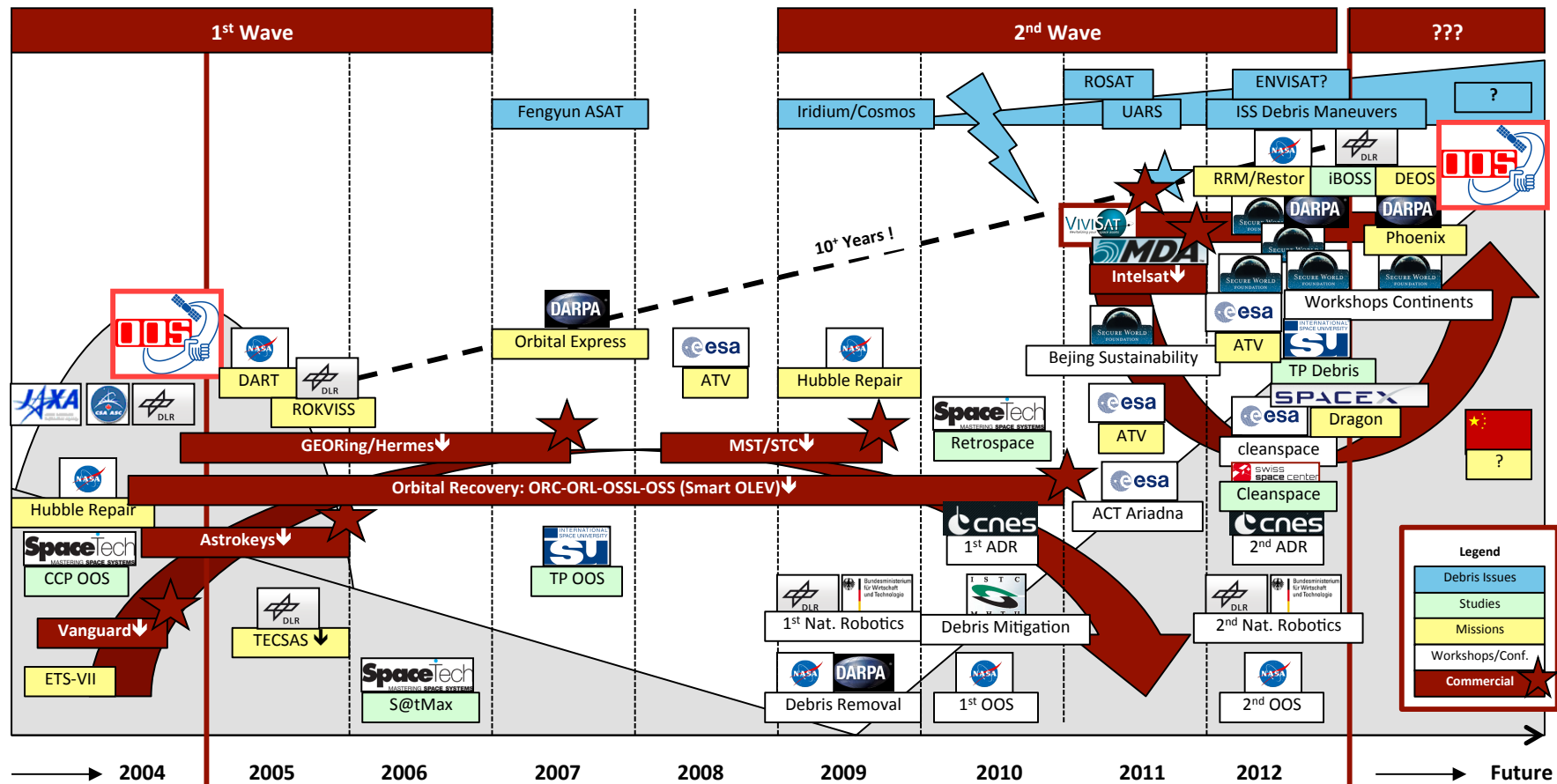
Investors: "Often Just 2 Good 2B True!"

Status Quo & Where Are We Heading?

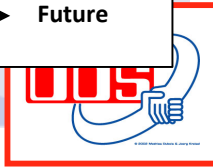
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„Riding the Waves“ On-Orbit Servicing (OOS) & Active Space Debris Removal (ADR) 2004-2012



What to Tell Investors?

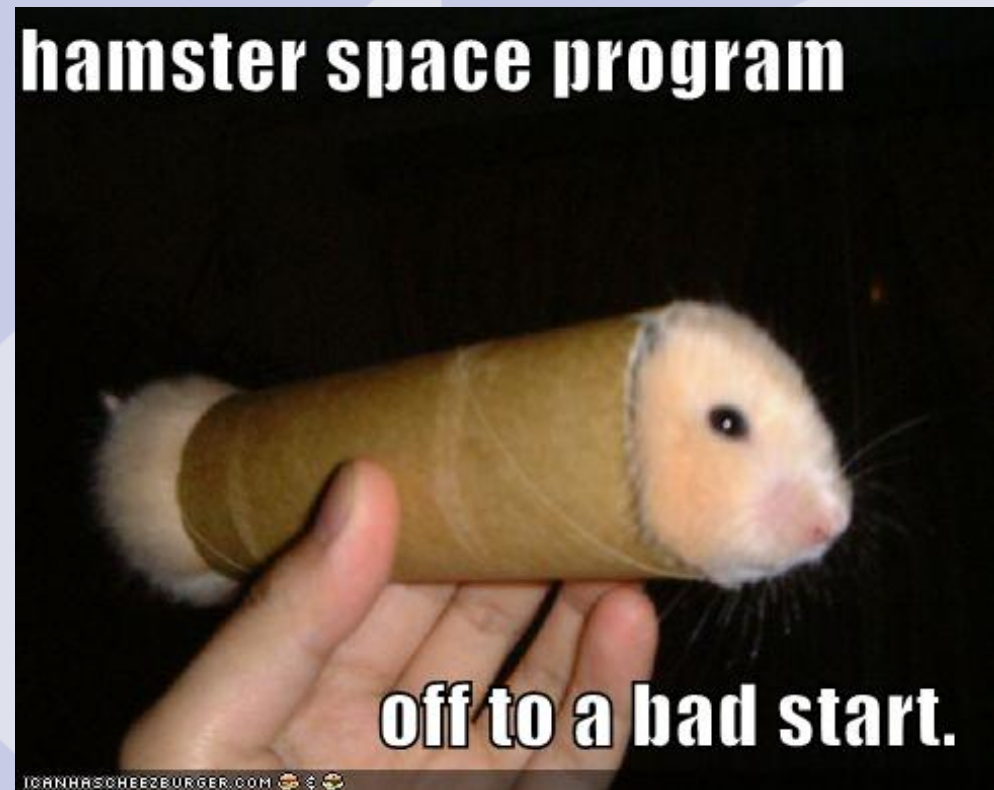


Investors See Many Naive Propositions ... &

- Ignorance
- Arrogance
- Wrong Focus
- Over-Doing
- One-Shot Routes
- ...

But Mostly Great Tech!

**Less (But Right)
Can Be More!**



Most Commercial OOS Business Ventures Failed to Raise Funds!

Investment in Commercial OOS?

▪ Facts

- OOS = a Virgin Market
- All OOS Biz = NewCos/Startups
- Life-Cycle-Based Financing: (Early-Stage) **"Equity"**
- Value-Adding Needs (via Investors)

▪ What Investors?

- Government (-)
- Strategic (+/?)
- Financial (+)**
- Private (?)

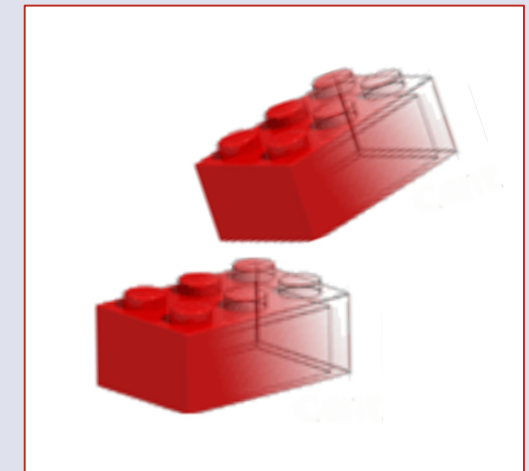
**Excess Liquidity
in the International
Investment Industry!**

▪ What Makes Investors Tick?

- Proper Business Environment
- Clear Value Proposition & Business Model
- Trust & Confidence
- Upside Potential **& Timing**
 - **"Exit"!!! → Capital Gain** (Financial Investors)
 - Long-Term Synergies (Strategic Investors)

Message (Building Blocks)

- **OOS Has Game-Changing Potential**
- **A Market in the Making** (Some Sat Ops Signed Up Already)
- **Economics & Finance Issues Not Yet Fully Understood**
- **OOS Biz to Be Geared Around the Mission** (Not Vice Versa)
- **Proper Structuring Is Key**
- **Actors to Fit & Play in the Right Box**
- **In-Orbit Demonstration Mandatory**
- **Government Agencies to Pave the Way**
- **Careful Build-Up of OOS Range**
- **First-Mover Danger Potential** (e.g. Accident)
- **Investors Ready to GO, IF ...**



Case Compatibility with Investment Industry!

Hence, ... Where Is the Profit?

Thank You!

