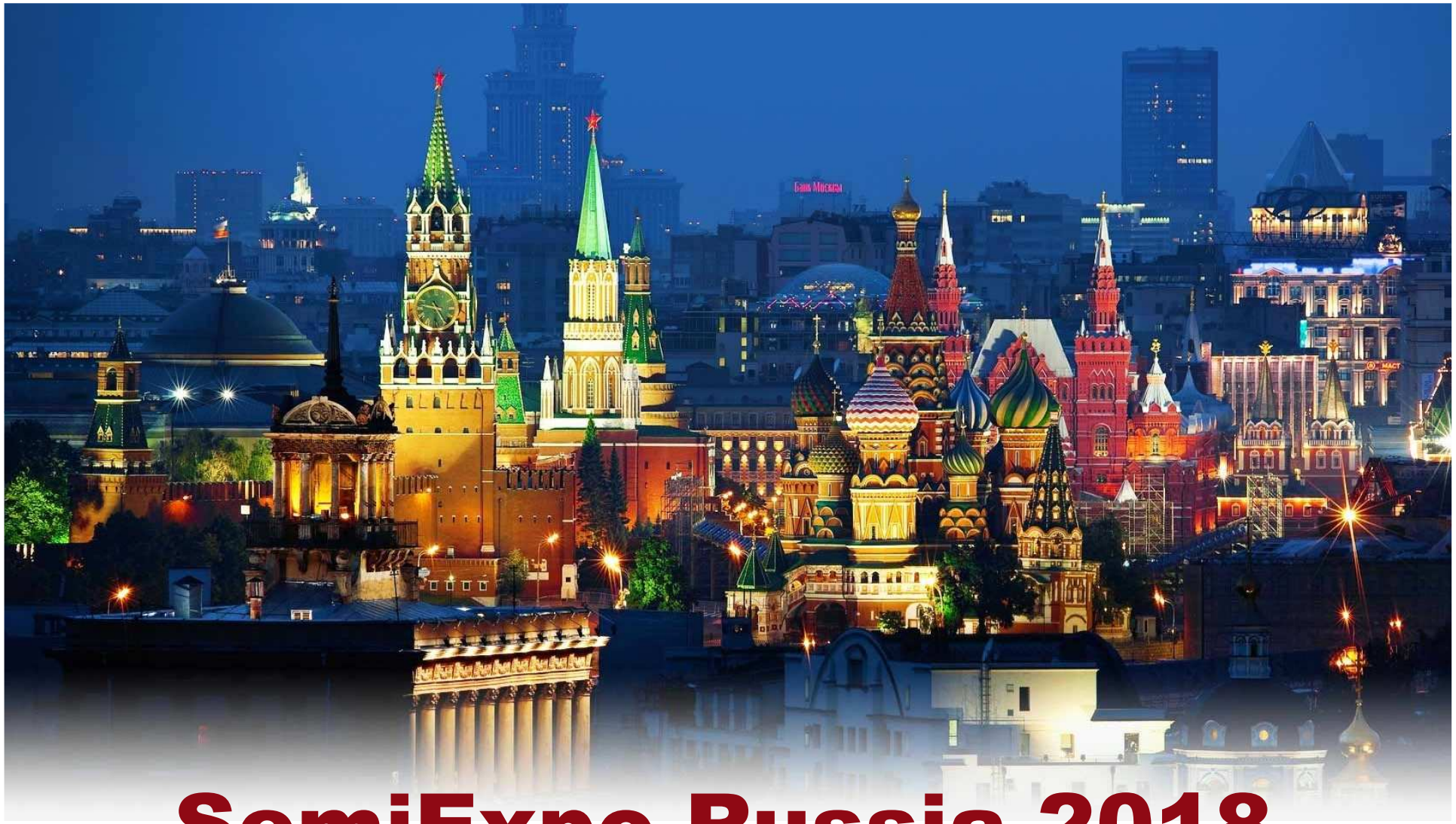


SemiExpo Russia 2018

Malcolm Penn, Chairman & CEO, Future Horizons

Global Digital Economy: Opportunities For Russia In The Next Industrial Wave

For A Copy Of This Presentation Please Give Me Your Business Card/E-Mail Address

Future Horizons In Russia/CIS + ELINT SP

Future Horizons

- Active In Russia/Eastern Europe Since Founded In 1989 (100+ Visits Since)
- World's First Analysis Report On Russia/CIS/East Europe SC Industry (1990)
- East-West Electronics Moscow Office/Research Representation (1991)
- Strategic Partnership With Electronintorg/ELINT SP (1993)
- World's First Analysis Report On Russia/CIS Electronics Industry (1993)
- World's First East-West Electronics Industry Forum (1993)
- World's First Russian/CIS Distribution Forum (1995)
- World's First Analysis Report On Russia/CIS Distribution (1996)

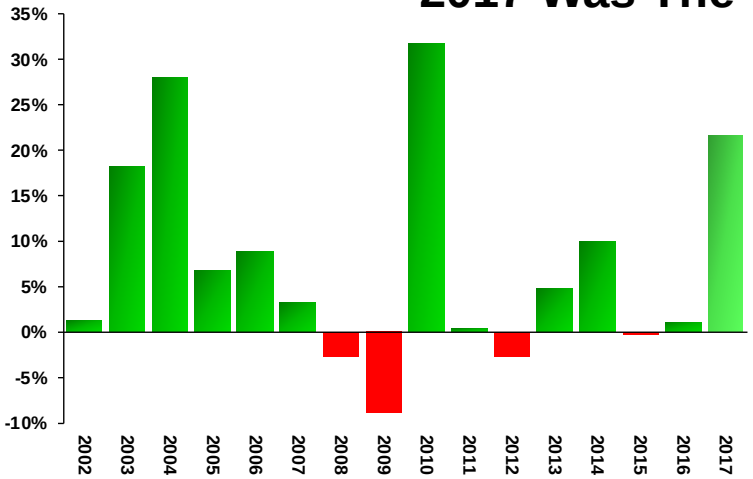
ELINT SP (Previously Electronintorg SP)

- Successor To Electronintorg V/O & Electrointorg Co. Ltd
  Face Of Soviet & Russian Electronics Industry Since 1968
- Focus In Business Development, Representation, Marketing, Business Support, Electronics Industry Exhibitions & Professional Translation

World's Premier Authority On The Russian Electronics Industry
Plus 5 Decades Experience In The Global Semiconductor Market

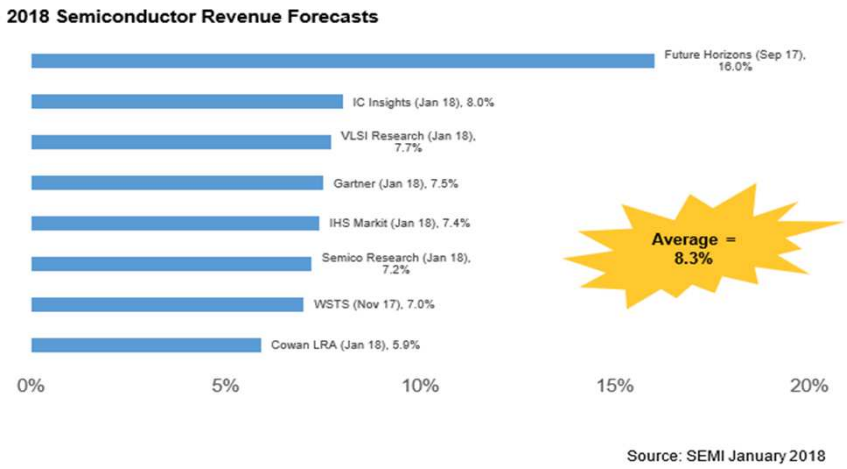
SC Market Update

2017 Was The Year Of Recovery (+22%)



- **This Time Around The Economic Growth Held**
- **FH Was First To Predict:**
  … 2017 Capacity Shortages (Sep 2016)
  … $400b Milestone (May 2017)
  … 20% Growth (Sep 2017)
- **Recovery Rolled Out Exactly As We Said**

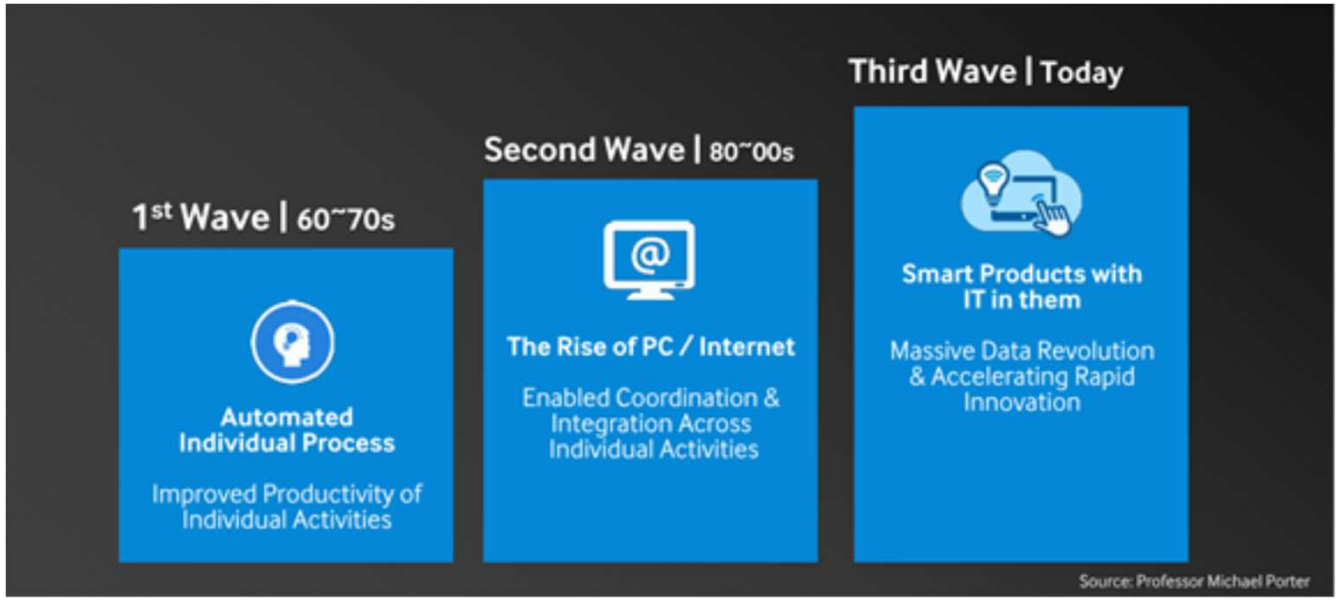
2018 Outlook



- **Further Double Digit Growth Inevitable**
  … Contrary To Industry Opinion!
- **Market Should Reach $500b in 2018**
- **Capacity Constraints Squeezing Supply**
  … Wafers & Passives Too
- **Economic Crash Sole Recovery Risk**
  … Plenty Of Issues; So Far So Good!

Ongoing Industry Disruptive Innovation

- **Invention Of Transistor** (Shockley, Bardeen, Brattain: 1947)
- **Invention Of The IC** (Kilby: 1958 / Noyce: 1959)
- **Microprocessor Development** (Faggin, Shima, Hoff, Mazor: 1970s)
- **Fabless/Foundry Model** (Chips & Technology / TSMC: 1980s)
- **SoC/IP** (MIPS, ARM, Imagination Technology etc: 1990s)
- **AI/IoT/Data/Robotics** (Alibaba, Amazon, Apple, Facebook, Google etc: 2010s)



Third Wave Industry Challenges

- **Traditional Semiconductor Companies Being Squeezed**
  … By Vertically Integrated Organisations
- **Few Start-ups Can Fantasize About Challenging Incumbents Head-On**
  … But They Can Readily Either Find A Profitable Niche Or Be Acquired
- **Raising Money For Hi-Tech Chip Start-Ups In 2015-16 Was A Nightmare**
  … Big, Acquisition-Hungry Tech Are Now Re-Targeting Semiconductors
- **China Has Shown A Particular Interest In Developing New A.I. Chips**
  … Russia Should Too
- **Need To Stay In Control Of The IP**
  … Co-Operation/Partnerships Can Be A Double-Edged Sword
- **Need To Develop A Collaborative Culture in Russia**
  … Both Horizontally & Vertically To Apply Industry Pressure On Establishment

Collaboration WORKS!

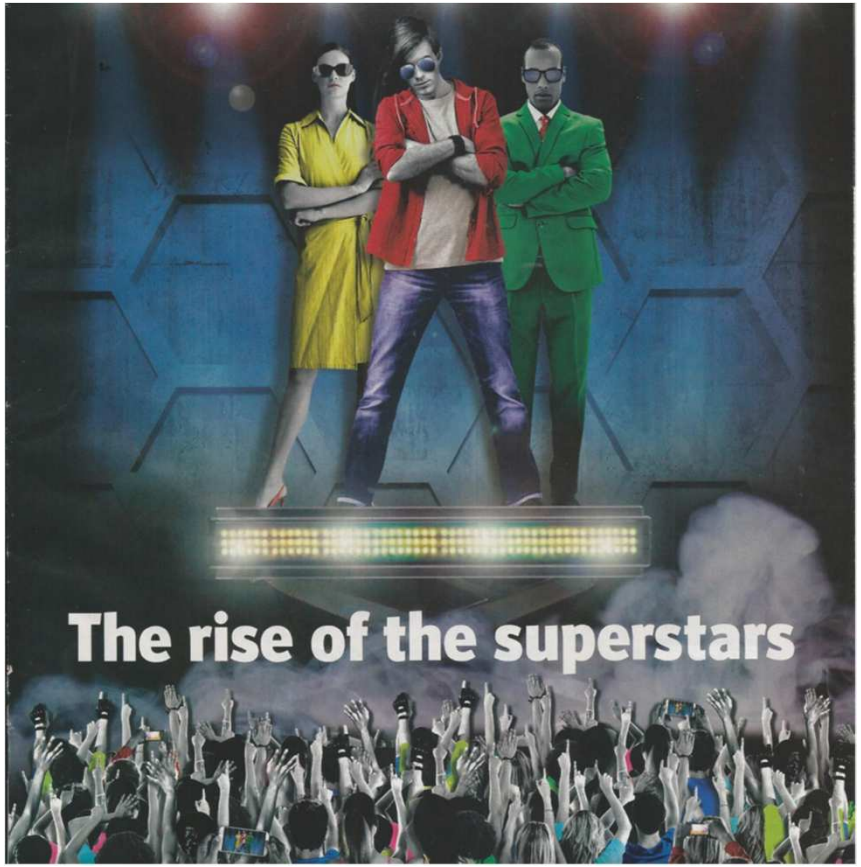
~45 Years Professional & Personal Experience (Since 1972)

Bottom Up (IP / Fabless / SMEs)

№	Team	City	Participant 1	Participant 2	May 29	May 30	Description
1	50ом	Tomsk	Popov Artem Alexandrovich	Bilevich Dmitry Vyacheslavovich	+	+	Development of a universal web-service for automatic construction and verification of mathematical models of microwave components
2	ASIC Lab	Moscow	Ageev Grigory Alexandrovich			+	High-speed operational amplifier (OU) with low power consumption, capable of amplifying the input signal with frequencies up to 250 MHz and is used in the analog-digital path as an ADC
3	CoilDesign	M[illegible]ow	R[illegible] [illegible]ha[illegible]vich	[illegible]ins Konstanti[illegible]ovich		+	[illegible]ev[illegible]ment of p[illegible]ra[illegible]om[illegible]s for [illegible]utom[illegible]ded [illegible]sign [illegible]onstruc[illegible] of 3[illegible]hod[illegible] of [illegible]ctors a[illegible]part o[illegible]ess p[illegible] transmission systems
4	DeftSecurity	St. Petersburg	Abaturova Marina Vladimirovna	Livshits Alexey Lvovich	+		Application of artificial intelligence to automate the response to information security incidents
5	EchON	Moscow	Tochkin Anton Vladimirovich	Zinin Ivan Zinin Dmitrievich	+	+	The development of the bat's vision system for robots
6	GDS	St. Petersburg	Kashaev Sergey Sergeevich	Vyatkina Evgenia	+	+	Development of the scheme of organization of the complex equipment providing mobile polar expedition with a full range of communication and data transmission services
7	HaClever	Moscow	Ichetkin Dmitry Vladimirovich	Sataev Emil Robertovich	+	+	Multi-functional universal game controller that allows you to control the character in the game of any kind and genre, through gestures, as well as use to control a smart home
8	PrintEl	Zhukovsky	Vitsukaev Andrey Vasilyevich	Tsarkova Yuliya Mikhailovna	+	+	Production of the antenna with the help of additive technologies with the possibility of integration into the body of the aircraft, ensuring the reduction of the weight of the aircraft by integrating the antenna into the body
9	RMT_OmSTU	Omsk	Remizova Ksenia Viktorovna	Konstantin Negodyaev Evgenyevich	+		Autonomous radio network protected and moving objects and alarms from USW-SW radio repiters. Designed for use in geographically dispersed alarm systems
10	Ruprotez	Moscow	Vetkin Egor Nikolaevich		+	+	Electromyographic device for control of upper limb prostheses based on artificial neural networks
11	WireBuster	Moscow	Indrikov Ivan Romanovich		+		Technology that allows you to increase the speed of wireless information transmission on the frequency of wi-fi without harm to humans
12	Al'vis	Moscow	Гришин Александр Сергеевич	Grishin Alexander Sergeevich	+	+	Creation of a universal cybernetic platform for the construction of Autonomous mobile service robotic complexes designed for outdoor work in a wide climatic range
13	Gas Analysts	Moscow	Davydov Sergey Andreevich	Gafurov Umejon Samijonovich	+		Development in the field of optical measurements for the control of dynamic gaseous media
14	Spark	Moscow	Biryukova Ksenia Sergeevna			+	Development of a set of discrete electronic devices (ED) with increased gain area and variable dynamic range, allowing to control the scattered EM field of the radar surveillance object by adjusting the efficiency of interaction between the integration of the EP and the efficiency of its conver[illegible]on of [illegible]energy of the [illegible]l a[illegible]ating electric field, for e[illegible]ple, in [illegible]xtreme space cond[illegible]s
[illegible]	SUAP	St. [illegible]	[illegible] Alexander Valerievich	[illegible]udin And[illegible] Elbrusovich		+	Ensu[illegible]e [illegible]y of production of hulls and structural parts of REA on the basis of additive technologies
16	Mer'kov	Moscow	Mer'kov Alexander Yurievich		+		Portable acoustic direction finder-leak detector that allows you to detect and evaluate the location of household gas leaks in residential buildings and industrial enterprises
17	OKSystems	Ufa	Scanomilk is a mobile milk quality analyzer	Patrushev Nikolay Vladimirovich		+	Compact mobile milk quality analyzer, which determines the quality of milk in terms of fat content and total protein
18	Pandas Kurchatov	Moscow	Korolev Mark Vladislavovich	Gorshkov Artem Alexandrovich			Creation of a universal measurement system for research and industrial
					+	+	complexes within the framework of the fourth industrial revolution
19	Lighting	Rostov-na-Donu	Sudiyn Pavel Vasilyevich	Ozerov Sergey Vladimirovich		+	Floor traffic light are made in the form of tiles 25x25 cm, with glowing irregularities: when the green signal animates the green wave, while the red signal is activated vibration
20	SKB-4	Moscow	Egorov Vasily Valerievich		+	+	A device has been developed for charging the phone, which uses energy from alternative sources, consisting of the main and additional units.The main unit accumulates energy from alternative energy sources to the level required for normal phone battery charging
21	SPbGUT	St. Petersburg	Telnova Kristina Borisovna		+		Most realizations of the Viola-Jones method can not work in real time. The purpose of this project is the transfer of the algorithm to the SoC architecture (a system on a chip), a FPGA + processor, which will allow realizing the algorithm in real time
22	Exotics	Vladivostok	Tamodny Vadim Anatolievich	Prasolov Vasily Nikolaevich	+		Exoskeleton designed for people confined to a wheelchair or after an injury
23	EcoMonitoring	Moscow	Boyarshinova Viktoria Dmitrievna	Perepelyuk Daria Sergeevna	+		Weather-sensing complex for environmental assessment in the conditions of dense development

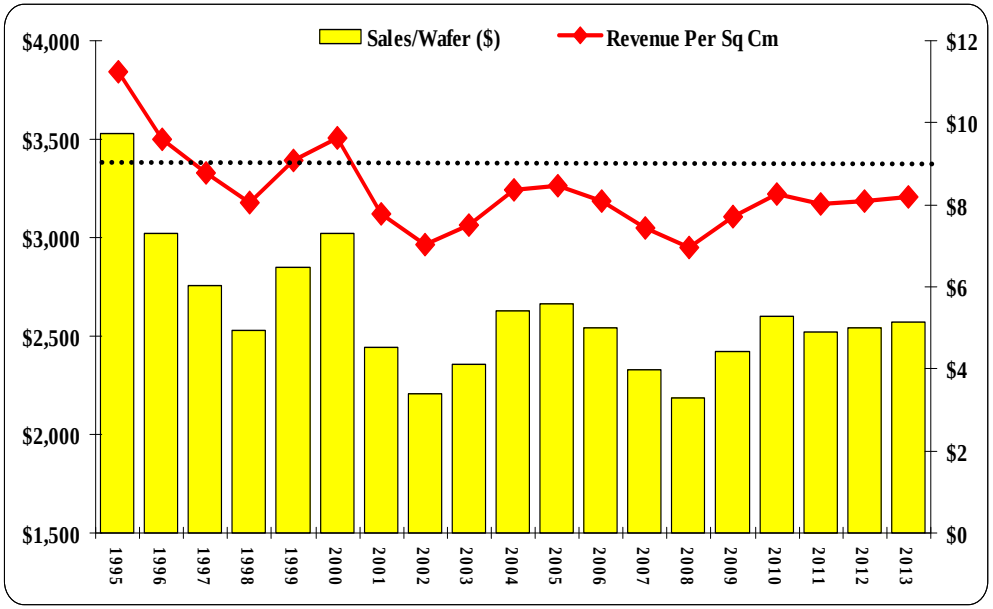
This Is Not A Bad Start!

Top Down (Corporate Colossi)



- **Entrenchment Of Superstar Firms In The World Economy**
  - Reinvented Old (GE)
  - Emerging Champions (Samsung)
  - High-Tech Wizards (Google, Apple, Facebook etc)
- **Admirable In Many Ways**
  - Churn Out Products That Improve Consumer's Lives
  - Provide $Billions Free Services
- **Challenging The Chip Firms**
  - OEM Direct
  - Designing Own SoCs (aka Apple)
- **China's Challenging Too**
  - Russia Should be Too
  - Needs Bottom Up Drive Too

Know Your Value Proposition



$50-$100 High-End MPU … $6-7 MCU/Std Logic/Memory

$0.05 At The Chipless/IP Level

$4.50 At The Foundries

$9.00 For Semiconductors

$50 For OEMs

$450 For Services /Content

Need To Circumvent The Industry Bars (Quantum Layers)

Source: SEMI/Company Reports/Future Horizons

Need A Disciplined Approach

FH Value Test

1. What Problem Are You Solving
2. What Value Are You Creating
3. How Will You Make Money
4. Barriers To Entry
5. Competition (Companies Not Products)
6. Is The Market Big Enough / Growing
7. How To Validate Idea
8. Map Out Your World
9. PEST (Political, Economic, Social, Technological) Or SWOT
10. How To Overcome Customer Inertia

Summary

- Disruption Is Inevitable … It Brings New Opportunities
- Moore's Law Is Not Just About Technology But Systems & Applications
- New Application Drivers Need Brain Power & Intellect
- Russia Can Drive Change Not Just Be Driven By It
- The Next Industrial Way Is A Natural Fit For Russia

We Can Help You Succeed

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The Global Semiconductor Industry Analysts

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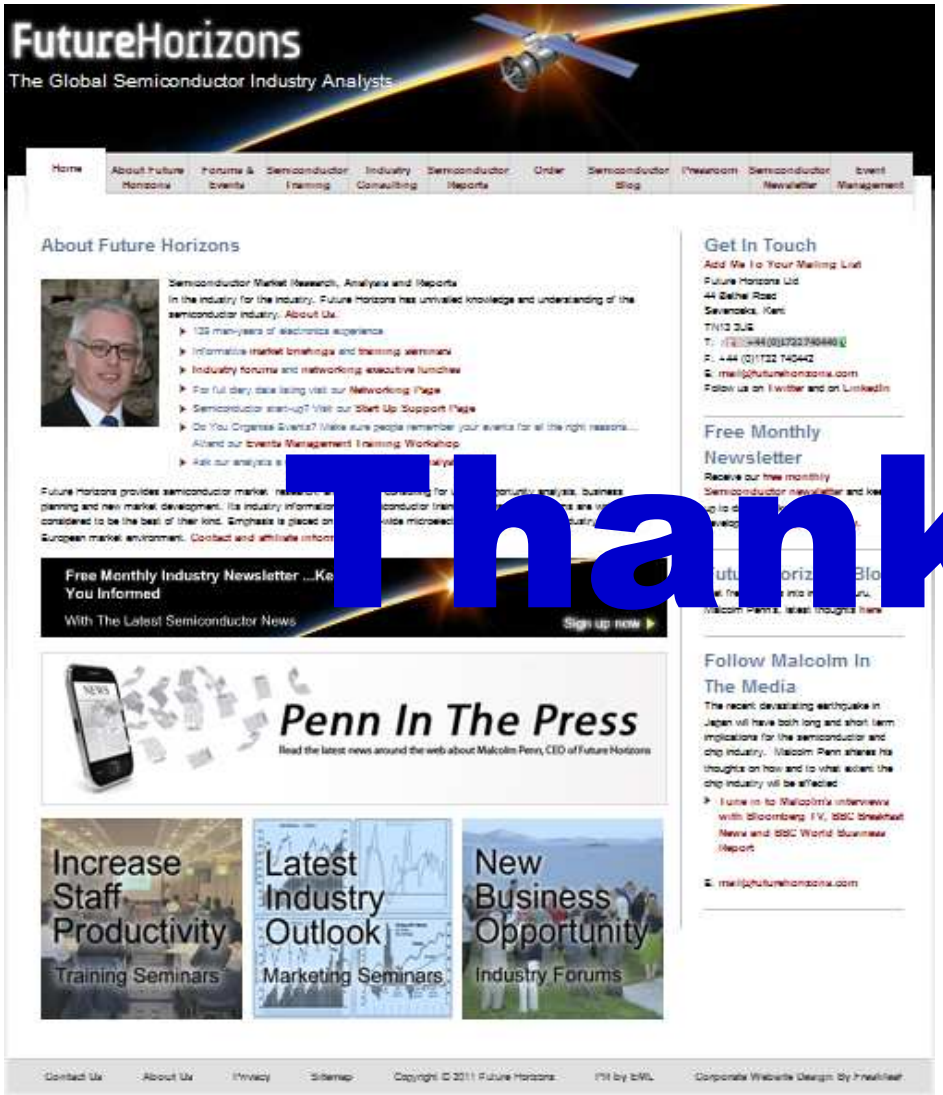
mpenn@futurehorizons.com

Already Helped 50+ Firms Establish Business Relationships In Russia
(Incl. ADI, ASM-L, DEC, IR, LG, Mietec, Nikon, Samsung, Synopsys, TI...)

We Can Help You Too …



Thank You

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