Welcome to
Pirelli Broadband Solutions
Agenda

- Pirelli Broadband Solutions (PBS)
  - Mission and Overview
  - Pirelli Labs S.p.A.
  - Market Scenario
- Access
  - Strategy
  - Products and Services
  - Roadmaps
- Photonics
  - Strategy
  - Products
  - Roadmap
- Why Choose Pirelli Broadband Solutions
Mission

“We are dedicated to providing our global partners with the most compelling broadband solutions. By leveraging our technology, developing innovative products and services, and forging strong relationships in the marketplace, we will continue to take broadband technology to new places.”

Pirelli Broadband Solutions Team - 2005
Overview

• **Pirelli Broadband Solutions**, a company within Pirelli & C. S.p.A. (PECI:MI), develops solutions for next-generation telecom infrastructures. The Group is divided into two areas:

  • **access**
    • Customized products, solutions and end-to-end platforms that deliver voice, data and multimedia-based services

  • **photonics**
    • Leading-edge optical components and systems that provide new functionalities and low-cost solutions
The Pirelli Group

Pirelli & C. S.p.A.

Pirelli Labs

Pirelli Broadband Solutions

access

photonics
Pirelli Labs

• In 2001, Pirelli invested in Pirelli Labs, one of Europe’s leading research facilities
  • 200 researchers
  • 12,400 patents (tires and telecommunications)

• Optical Innovation
  • Partnership with MIT (Cambridge, MA USA), Georgia Tech (Atlanta, Georgia USA)
  • Nanotechnology components and modules for optical networks

• Material Innovation
  • Fuel Cell, distributed generation, Distributed Sensor Network

• Process Innovation
  • CCM, Cyber Wheel, Cyber Tyre

Innovation Business Validation
Technology Scouting
## Broadband Access Market

Forecast: Europe’s Residential Broadband Technology, 2004 To 2010

### Market Share, 2010

<table>
<thead>
<tr>
<th>Service</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL</td>
<td>15,453</td>
<td>25,282</td>
<td>31,629</td>
<td>37,881</td>
<td>43,761</td>
<td>48,895</td>
<td>53,355</td>
<td>56,950</td>
<td>80%</td>
</tr>
<tr>
<td>Cable</td>
<td>4,434</td>
<td>6,358</td>
<td>7,182</td>
<td>8,011</td>
<td>8,648</td>
<td>9,283</td>
<td>9,965</td>
<td>10,484</td>
<td>15%</td>
</tr>
<tr>
<td>Other*</td>
<td>472</td>
<td>894</td>
<td>1,202</td>
<td>1,686</td>
<td>2,219</td>
<td>2,831</td>
<td>3,406</td>
<td>4,362</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20,358</td>
<td>32,534</td>
<td>40,014</td>
<td>47,577</td>
<td>54,629</td>
<td>61,009</td>
<td>66,725</td>
<td>71,796</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Includes fixed wireless, WiMAX, satellite, fiber, and powerline.

Source: Forrester
Network Segmentation

ACCESS
Large deployment in the 2000s (phase 1)

PHOTONICS
Large deployment in the 2000s (phase 2)

Large deployment in the 1990s

Future Photonics
Metro xWDM
MSxP

Future Broadband Con.
xDSL & FTTx

The bottleneck

1990s
Long Haul & Ext. Ultra LH

Large deployment in the 2000s (phase 2)
End-to-End Solution

Transport
- DWDM
- Router

Metro
- City8™ CWDM

Access
- IP DSLAM
- ADSL2+
- GPON System

Residential Broadband
- Multiplay Gateway
- HY-STB

End-to-End Solution
- IP DSLAM
- ADSL2+
- HY-STB
## Multiple-play Strategies

### Pirelli Management Platform (PMP)

<table>
<thead>
<tr>
<th>Single Play</th>
<th>Double Play</th>
<th>Triple Play</th>
<th>Multiple play</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Speed Internet Access</td>
<td>Single Play Services + Telephony</td>
<td>Double Play Services + IPTV, VOD, Video Telephony</td>
<td>Triple Play Services + Fixed Mobile Convergence</td>
</tr>
</tbody>
</table>
Strategy

- Provides fully-customized, end-to-end, broadband access solutions for telecommunications operators

- Partners with telecoms to provide proven solutions

- Maintains a product line that spans a wide range of access technologies
Modular Access Gateways

ADSL Router
Ethernet 10/100
USB
DECT/VoIP
QoS
Wireless 802.11g
PowerLine Communication
SNMP/TR-069
Access Gateways

ADSL 2/2+
Ethernet
USB host/device
VoIP
QoS
Wireless 802.11g/b
DECT
TR-069
MultiMediaGate Hybrid STB

IP Television
iDTT-MHP
High-Definition TV
Multiple Conditional Access
DRM
H.264 Decoding
Strategy

- Provides optical components and subsystems that will **lower network OPEX** and **eliminate disruptions** in the metro and access areas

- Offers highly-integrated solutions by leveraging **miniaturization** and integration of optical components at wafer level through **nanotechnology** and **tunable/pluggable solutions**
Product Lines

- **CWDM Metro Access System**
  - Multi-service platform combining low-cost CWDM optical technology with carrier-class features

- **Radio over Fiber (RoF)**
  - Enables transport over optical fiber of 3G mobile radio signals between Radio Base Station and Remote Antenna Unit

- **Tunable Laser**
  - Provides optical transmitter wavelength flexibility over the entire C-band with high quality, spectral purity and frequency stability

- **Tunable Optical Add & Drop Multiplexer**
  - Allows wavelength flexibility

- **Triplexer**
City8™ CWDM Metro Access System

Transponder with pluggable optical receivers
3R regeneration
Sub-lambda multiplexing
Optical protection
SNMP-based supervision
CLEI codes
G.6942.2 and G.695 compliant
Radio over Fiber (RoF)

Antenna remotisation
Cell extender
Indoor and outdoor applications
Base Station co-location
Reduced deployment impact for micro-cell applications
Metro access infrastructure sharing
Dynamically Tunable Laser

- Sparing for DWDM line cards
- Dynamic provisioning
- Dynamic add /drop
- Channel protection
- Agile wavelength routing
- Testing and Measurement
G-Neptune 1.2/2.5 Triplexer

- Passive Optical Networks
- G-PON standard
- Optical network termination
- Video broadcasting
- Residential and business CPE
- Indoor and outdoor applications
Tunable Optical Add & Drop Multiplexer

- Allows flexibility in point-to-point optical Networks
- Dynamic wavelength allocation in metro ring
- Increases wavelength efficiency
Why choose PBS?

- Brand
- Global
- Innovation
- Customization
Thank You