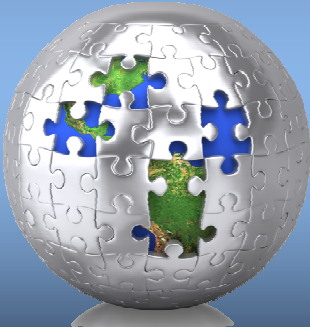


REGIONAL SYNOPSIS



- **Barbados** – No decisions
- **Bahamas** – No decisions, but on agenda for meeting of The Utilities Regulation and Competition Authority (URCA) in last quarter of the year
- **Guyana** – No decisions

3

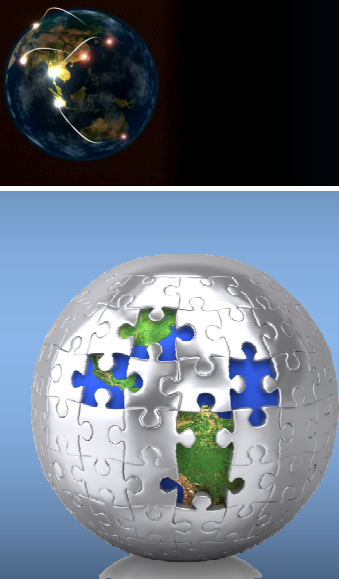


REGIONAL SYNOPSIS



- **Organisation of Eastern Caribbean States** –
- No decisions, but ECTEL reportedly favours adopting the US (ATSC) standard.
 - In **Dominica** there are no over the air TV stations.
 - In **ECTEL** States cable TV pretty much dominates the Television Market space.
 - Slower pace possible in these territories because there is no immediate benefits to spectrum usage etc.

4



REGIONAL SYNOPSIS

- **T & T** – No decisions, but discussions underway. European (DVB-T) standard being given serious consideration in some quarters. Also some reports reference T&T as having adopted DVB-T but no information publicly available
- **Jamaica** – No decisions, but National Steering Committee is recommending 2015 for DSO

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REGIONAL SYNOPSIS

Jamaica:

Chronology of DSO Activities


- **2003** BCJ convenes Digital Television Forum
- **2008** BCJ convenes Regional Digital Switch-over Workshop
- **2008** BCJ prepares Digital Switch-over Paper for the Government
- **2009** National Steering Committee for Digital Switch-over established.
 - Chaired by the Minister of Information
 - 3 Co-chairs : broadcasting, cable and regulator
 - Members drawn from industry, government, consumer affairs.
- **2010** BCJ hosts Regional Forum on Policy and Regulation in the Electronic Media Sector
 - Consensus for regional approach in selection of a digital standard and determination of a switch-over date.
- **2010** RFP for DSO Study being finalised
- **2011** DSO Study earmarked to begin

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Managing The Transition To DTV

GENERAL (POLICY) CONSIDERATIONS

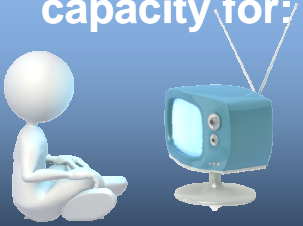
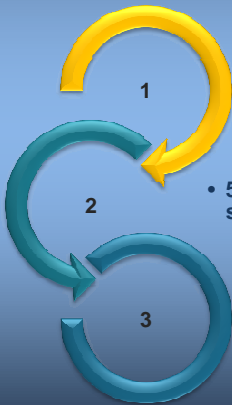


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General (Policy) Considerations

1. Use of increased transmission capacity for:


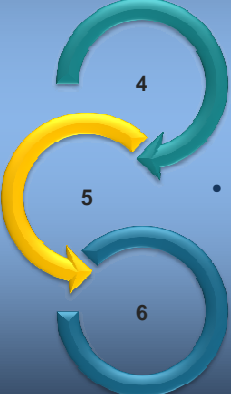



- Superior technical quality
- high definition/higher resolution/wide-screen images
- 5.1 channel surround sound audio ?
- Multi-casting
- delivery of multiple standard definition television (STD) and/or HDTV programmes in one broadcast channel




General (Policy) Considerations

1. Use of increased transmission capacity for:






- More Broadcasters?
- Electronic Programme Guide
- Data Broadcasting Content



General (Policy) Considerations

1. Use of increased transmission capacity for:

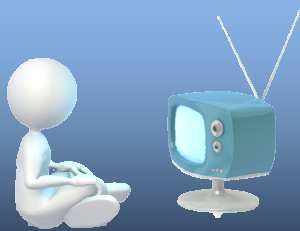



- Viewing TV programmes via mobile phone
- IPTV via Broadband
- Regional/local/ Community terrestrial television



General (Policy) Considerations

2. Opportunity for:



- **Free over the air** broadcasters
 - positioned better to compete with cable, satellite & newer delivery platforms including mobile and IPTV by ensuring interactivity
 - new content, better quality, enhanced viewing experience.
- Expansion of **terrestrial** TV service to under-served areas



Managing The Transition To DTV

TECHNICAL CONSIDERATIONS





TECHNICAL CONSIDERATIONS



- Technical Standard
- Migration Strategy
- New production equipment
- New digital transmission technology
- Customer Receiver equipment
- Proprietary or Open Digital Terrestrial Technology?

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TECHNICAL CONSIDERATIONS

A. Technical Standards:

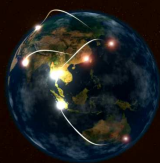


3 Technologies being used in the Americas

- ATSC (USA, Canada, Mexico, Bahamas and Bermuda)
- DVB- T (Trinidad & Tobago, Panama, Uruguay)
- ISDB –T

All standards are digital and are more or less equivalent

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TECHNICAL CONSIDERATIONS

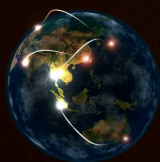
1. Migration Strategy:

Core elements to realise gains from digitization



- **Equipment type** and retro-fitting (transmission facilities, studio equipment, customer equipment);
- **Availability of receivers**, programming and access to technical support
- **Coverage preservation** to yield the same footprint as under the analog system

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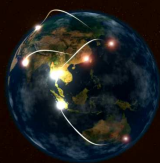
TECHNICAL CONSIDERATIONS

1. Migration Strategy:



- **Type of infrastructure** to be adopted Multi-frequency or single frequency network infrastructure?
- **Digital enabling Network Integration** (product to consumption)
- **Digital enabling Cross-Platform Distribution** (over the air, internet, mobile phones etc.)

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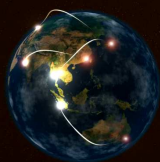
TECHNICAL CONSIDERATIONS

1. Migration Strategy:



- **Scaling to new services** to which a DTV system is adaptable (mobile DTV and Advanced Features such as 3DTV)
- **Backward compatibility** of future system improvements and technology leaps
- **Collaboration with other platforms** e.g. broadcasters using the Public Switched Telephone Network to provide a return link for interactive service.

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TECHNICAL CONSIDERATIONS

1. Migration Strategy:



- Choosing realistic levels of **transmission power** and planning for interference issues
- Conducting adequate small-scale **digital technology trials** before launching

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TECHNICAL CONSIDERATIONS

1.1. New Production Equipment

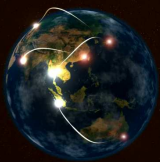
Video Format (HDTV)

- requires installation of completely new production, postproduction, and distribution equipment.

Options:

- Feed HD programming to the DTV transmitter;
- Upconvert SD programming to HD format
 - Allows SD programming to be intercut or mixed with HD programmes

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TECHNICAL CONSIDERATIONS

1.1 New Production Equipment

Video Format (HDTV)

- **The Future:**
 - Range of HD equipment expanding
 - HD equipment prices will continue to fall with increased demand and supply
 - More feasible to implement cost-effective HD portable and studio systems

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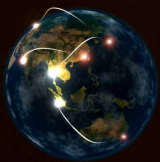
TECHNICAL CONSIDERATIONS

1.1 New Production Equipment

Video Format (HDTV)

- **The Future:**
 - More broadcasters worldwide equipping HD studios and systems.
 - Therefore, **HDTV** is the natural evolution of television, driven by pay-TV operators and consumer demand.

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TECHNICAL CONSIDERATIONS

1.1. New Production Equipment

Video Format (SD DTV)

- **SD DTV** - Digital Studio Equipment
 - many studios already using digital equipment, so least additional cost
 - Analog/partially analog stations and facilities will need new equipment e.g. Cameras, VTRs, editing systems

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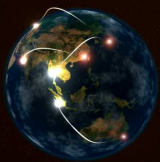
TECHNICAL CONSIDERATIONS

1.1 New Production Equipment

Datacasting
 *e.g. on demand stats during a sports event

- May require new infrastructure to distribute and integrate datacasts into the DTV service
 - a new production unit

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TECHNICAL CONSIDERATIONS

1.1 New Production Equipment

IT-Based Equipment and Systems


- video and audio recording and processing tasks increasingly computer-based.
 - Video and audio storage as computer files for distribution over computer networks.
- Introduction of IT systems complements the change to digital transmission

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TECHNICAL CONSIDERATIONS

2. New Digital Transmission Technology




- **Most technical and expensive aspect of DSO**
- Switch to **digital transmission**, in effect, requires:
 - duplication of analogue facilities during the transition

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TECHNICAL CONSIDERATIONS

2.1 New Digital Transmission Technology



The new facilities required include:

- New STL
- Digital transmitter
- Transmission line
- Antennae

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TECHNICAL CONSIDERATIONS

2.1 New Digital Transmission Technology



The new facilities required include:

- Test and monitoring equipment, including:
 - Baseband digital video & audio measurement set
 - Transport stream analyser
 - 8-VSB and/or COFDM analyser
 - Vector signal analyser
 - IT diagnostic and test tools,
- Audio:
 - DTV enables 5.1 channel surround sound transmission but it is not mandatory

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TECHNICAL CONSIDERATIONS

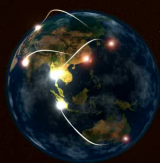
2.2 New Digital Transmission Technology



Multiple Programme Services

- Broadcasters transmitting multiple programmes on one DTV multiplex will need to expand playout and master control facilities

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TECHNICAL CONSIDERATIONS

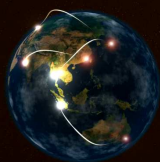
2.3 New Digital Transmission Technology



Electronic Programme Guide and System Information

- Inclusion of EPG information in the DTV bit stream requires equipment for producing/ updating information
- And a method of communicating from EPG source to where the DTV bit stream is generated.

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TECHNICAL CONSIDERATIONS


3. Customer Receiver Equipment



Digital Cable


- Set-top box for decompression and decoding at the reception end (TV set);
- Capable of genuine two-way communication

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TECHNICAL CONSIDERATIONS


4. Customer Receiver Equipment



Digital Terrestrial Television


- set-top box for decompression and decoding at the reception end (TV set); or Integrated digital TV
- essentially one-way communication
 - BUT constraint overcome by using telephone line as a 'return path'
 - OR transmit extra programmes simultaneously BUT hidden until selected by the viewer (impure or partial interactivity)

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TECHNICAL CONSIDERATIONS

5. Proprietary or Open Digital Terrestrial Technology?



- Pay TV** broadcasters might want proprietary technology
- BUT** will potential subscription justify cost of custom manufactured boxes?

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Managing The Transition To DTV

HUMAN RESOURCE & DEVELOPMENT CONSIDERATIONS



HUMAN RESOURCE & DEV. CONSIDERATIONS

What are the HRD implications of digital switch-over?

- Re-skilling/training/expansion priorities
 - Engineering and technical
 - Marketing
 - Customer Service
 - Focused on installation & technical assistance
- Downsizing/ right-sizing

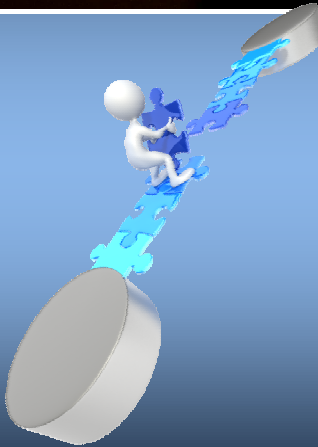


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Managing The Transition To DTV

CUSTOMER SERVICE CONSIDERATIONS



CUSTOMER SERVICE CONSIDERATIONS

Customer service & information plan - Impact of DTV:

- Programming
- Environmental effects:
 - energy usage
 - equipment dumping
 - disposal of e-waste
- Required equipment and when to buy
- How to set up and use new equipment
- Access to information and technical assistance

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Managing The Transition To DTV



LEGAL CONSIDERATIONS




LEGAL CONSIDERATIONS




- New licensing conditions/requirements e.g
 - Conditional Access**
 - Requirement that set-top boxes be conditional access ready (capable of receiving all signals)
 - Contentious issue for STV operators who have rolled out service with proprietary Set Top boxes
 - A good “lock-in” device
 - BUT low switching cost is key in competition terms**

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LEGAL CONSIDERATIONS



•Negotiating:

- joint venture/co-ownership** of DTV system Infrastructure/transmission/distribution network;
- broadcast rights** with cable and satellite companies OR content providers;
- **(digital) spectrum licence fee** which reflects:
 - increased competition
 - cost of simulcasting during the transition period

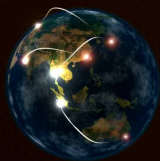
39



Managing The Transition To DTV

FINANCIAL CONSIDERATIONS





FINANCIAL CONSIDERATIONS

Extra cost for:

- New **programmes** for new channels
- New **production equipment** to deliver new technical quality and features
- Investment in **new digital transmission technology**
- Simulcasting** during the transition period
- Digital **technology trials**
- Customer service**
- Marketing** of new services
- Human resource **capacity** building



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FINANCIAL CONSIDERATIONS

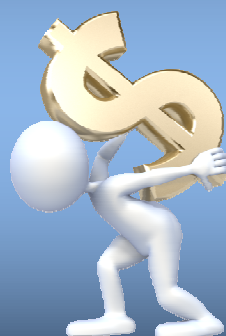
Potential For New/Additional Revenue:

Digital Cable:

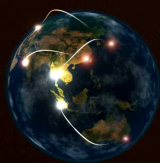
- video-on-demand, Internet, telephony, digital programme (Ad) insertion;

Digital Terrestrial Television:

- free to view (supported by advertising)
 - Free to View could encourage consumer take-up of digital.
- subscription or pay-per-view



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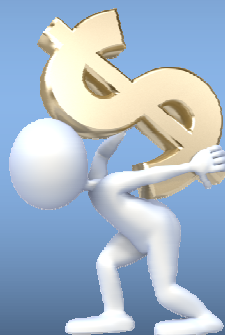


FINANCIAL CONSIDERATIONS

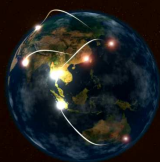
Potential For New/Additional Revenue:

Data broadcasting:

- data broadcasting services supported by advertising
 - Depends on consumer take-up of data-capable DTV sets
- TV broadcasters leasing bandwidth to third parties for data broadcasting
 - new business orientation for broadcasters/different marketing expertise



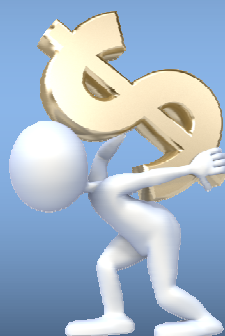
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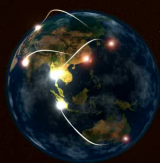
FINANCIAL CONSIDERATIONS

Other Financial Considerations:

- Costs affected by availability of receivers, programming and access to technical support
- Social responsibility to 'green' operations and service delivery?



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FINANCIAL CONSIDERATIONS

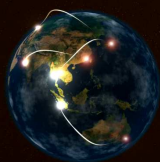
Other Financial Considerations:

•Supply of Receivers (2 models/options):

- broadcasters take on the risk of ordering and retailing boxes; **OR**
- broadcasters responsible for content and transmission only
 - BUT** risks undermining investment by non availability of receivers or technical issues with receivers



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FINANCIAL CONSIDERATIONS

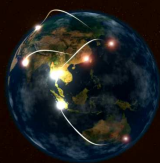
Other Financial Considerations:

•Scale costs based on digital transition options:

- soft cut** - requiring simultaneous analog and digital services but more expensive since 2 transmission infrastructures needed;
- hard cut**- future date set for Cut Over
 - Recommended approach for Jamaica
 - less expensive because same transmission infrastructure and only one channel required
- gradual cut-over** - broadcasters convert as funds become available
 - Broadcasters better able to control costs
 - Risk of technology lag



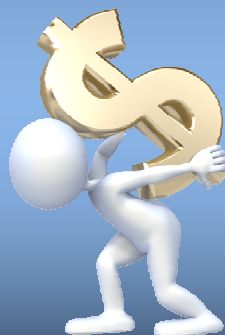
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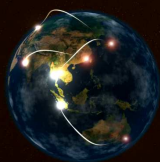
FINANCIAL CONSIDERATIONS

Other Financial Considerations:

- establish **realistic price points** in line with disposable income;
- take advantage of **equipment financing** (e.g. US EX-IM bank offers loans to broadcasters who purchase transmission and studio equipment from US manufacturers.)
- Manage process so that increased advertising not outweighed by the costs of switching to digital



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Managing The Transition To **DTV**

RISK MANAGEMENT





RISK MANAGEMENT



Maintain a register of potential risks and create a strategy for dealing with them

Examples of risk:

- Inadequate communication (internal and external)
- Shortage of reception equipment
- Misinformation from retailers
- Missed deadlines by manufacturers
- Creative destruction of technology

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RISK MANAGEMENT



Maintain a register of potential risks associated and create a strategy for dealing with them

Examples of risk:

- Inadequately trained staff (e.g. customer service; aerial installers)
- Lack of co-ordination between marketing and technical/customer service
- Customers who find digital TV interaction complex (e.g. remote control)
- Increased energy usage and cost
- Copyright protection issues (including the re-transmission of terrestrial broadcasting signals by cable operators)

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RISK MANAGEMENT



Maintain a register of potential risks associated and create a strategy for dealing with them

Examples of risk:

- **Costly rights** negotiations (programming and distribution) between digital terrestrial multiplex licensees and programme channel suppliers/broadcasters
- Early **demand** from foreign content distributors/market for only HD content
- Unavailability of funding or expensive **sources of funding** to cover costs

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RISK MANAGEMENT


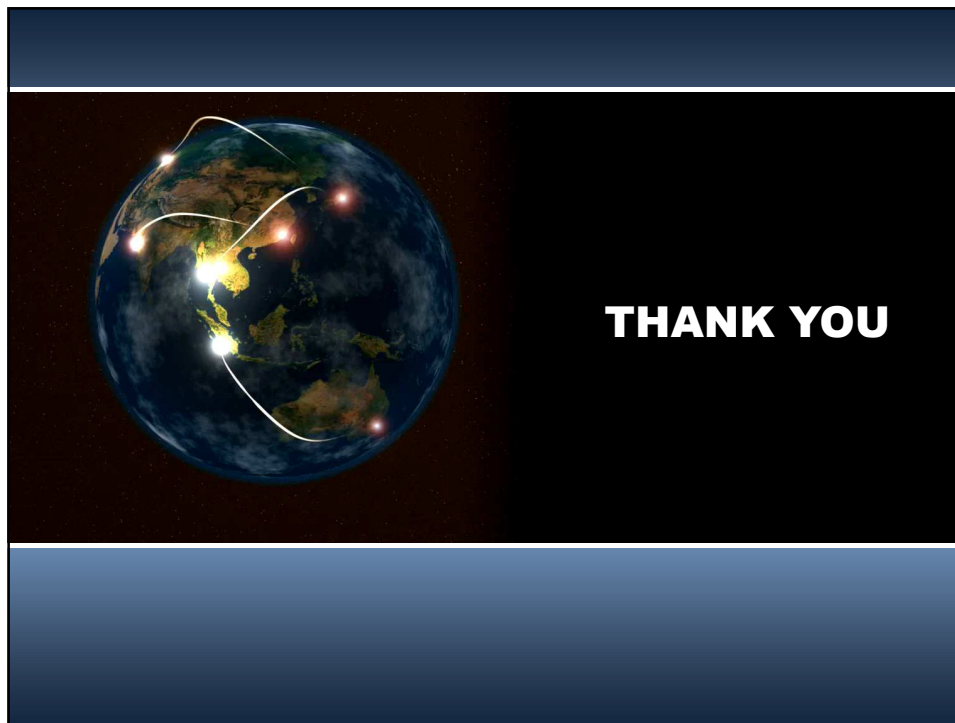


Maintain a register of potential risks associated and create a strategy for dealing with them

Examples of risk:


- Inadequate financial strength or other requirements to qualify for digital terrestrial multiplex licences
- Regulatory decisions e.g. specified common conditional access arrangements
- High receiver prices and slow customer take-up

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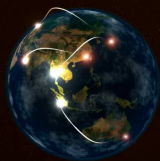
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cgreen@broadcom.org
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