



Competitive Edge of NREN and Financial Sustainability

By

Building Stakeholder's “Value and Community Force”

Presented by

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Former Marketing & Strategic Development Specialist, BdREN

About BdREN Trust

- ❑ **Bangladesh Research and Education Network (BdREN)** is a high-speed data communication network established under Higher Education Quality Enhancement Project (HEQEP) to meet up specialized requirements of the academic and research communities of Bangladesh.
- ❑ Under Ministry of Education (MoE), University Grants Commission (UGC) of Bangladesh has been implementing Higher Education Quality Enhancement Project (HEQEP) with assistance from World Bank.
- ❑ The HEQEP tenure completed on 31 December 2018. BdREN Trust, already established, and operating and maintaining the network from 01 January 2019 on not-for-profit basis.

BdREN TRUST : VSION & MISSION

VISION:

- ☐ To be an enabler for excellence in Research and Education sectors by strengthening the quality of research, education, innovation and strategic collaboration.

MISSION:

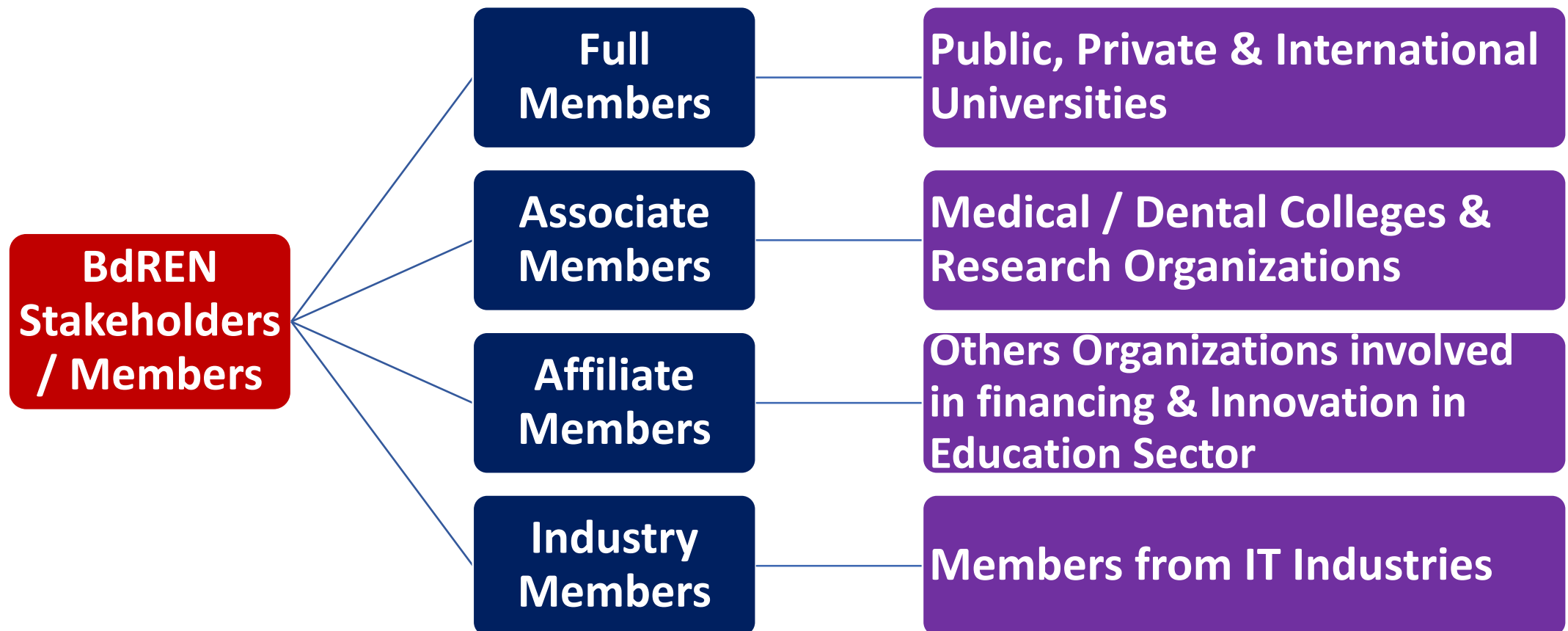
- ☐ Accelerate the development of the knowledge and information society.
- ☐ Strengthen Bangladesh's position as a recognized regional leader for research, education and development.
- ☐ Provide efficient communication and dissemination of information within the education and research communities.

BdREN TRUST : OBJECTIVES

- ☐ Building and operating a higher level Bandwidth, Availability and Secure network.
- ☐ Providing cost-effective & best in class Applications and Services.
- ☐ Connectivity with global academic community and learning resources.
- ☐ Facilitate international collaborative research and will catalyze innovation in the country.
- ☐ Develop a Non-profit Trust organization.

BdREN Stakeholders

- ❑ Stakeholders are most powerful force for Business & Sustainability cases.
- ❑ Trust will be sustainable from positive value Propositions of Stakeholders.
- ❑ Full Members only have the rights to be part of BdREN Governance or TRUST.



BdREN Organizational Structure

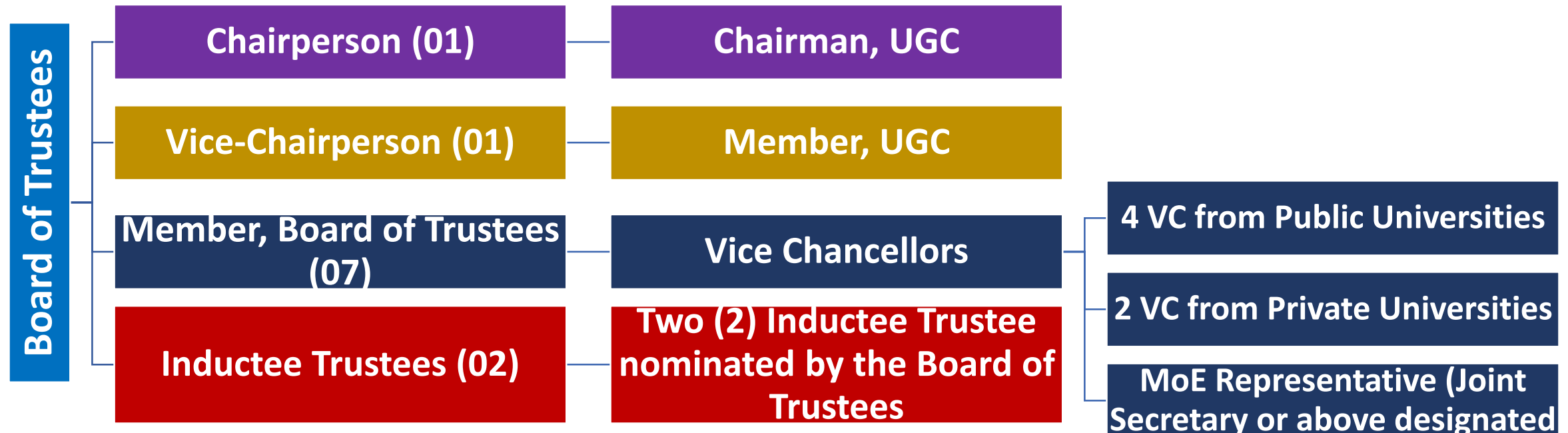
■ Phase-1: Project Preparation

■ Phase-2: Project Implementation and

■ Phase-3: Operation & Transfer of BdREN Project to a Trust Organization

A. Transition from Project Implementation Phase to Fully Operational Phase.

B. Trust establishment and Operational.



Competitive Edge for an NREN And REN Services in Bangladesh

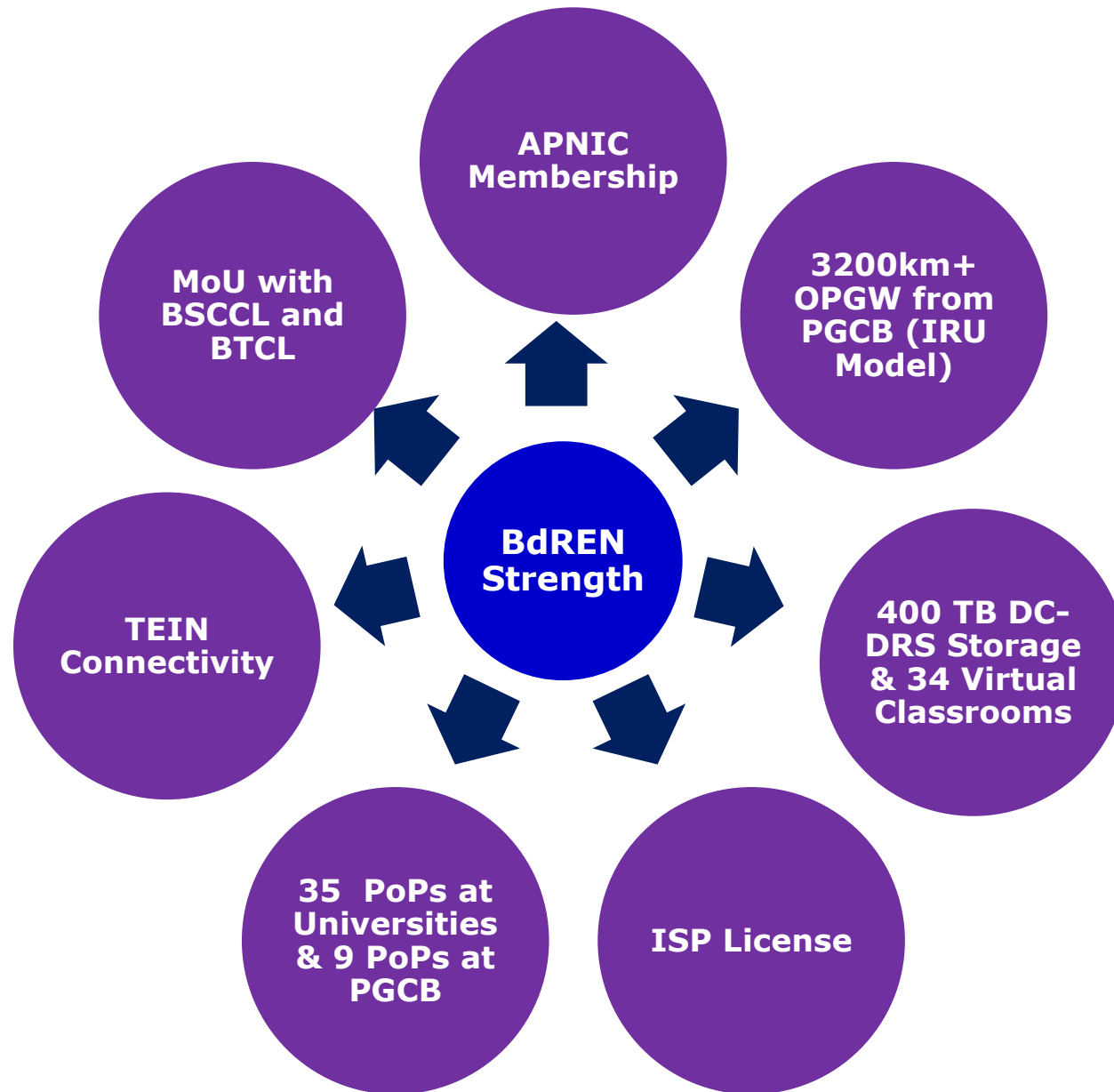
Competitive Edge for an NREN

- ❑ Competitive Edge is the fact that an Organization has an advantage over its competitors through the innovation.
- ❑ NREN should focus on below major competitive advantages for the Sustainability:
 - Cost Leadership
 - Product/Service Differentiation
 - Niche Strategies
- ❑ User Experience, Improve Customer Satisfaction, Building Loyalty, High-Performance and Reliable Connectivity are the basic requirement from a customer to gain Competitive advantages for any Organization.

Competitive Edge of BdREN to cater NREN Objectives

- ❑ Services to be provided to the Research & Education community are specific and different from the commercial networks.
- ❑ High performance, reliability, availability, secured Network by building of long term and sustainable physical fiber infrastructure with reduncies.
- ❑ Advanced network technology and Productive Applications.
- ❑ Facilitate smart, innovative and creative Community
- ❑ BdREN aims to connect all universities, research institutions and healthcare across Bangladesh.

BdREN Current Strengths and Capabilities in Competitive Edge



Opportunities for REN Services in Bangladesh

Academic Institutions							Research Institutions
Universities		Medical Colleges			Colleges		Public & Private
Public	Private	Public	Semi Private	Private	Government	Private	BRRI, BARI, Atomic Cell etc.
37	85	30	06	68	275	1971	
Approx. 3.0 mn Students Base		12,000 Students Base (Approx.)			3.6 mn Students Base (Approx.)		

Member Projections of BdREN Trust

Assumptions: New Members Integration

- ☐ **Permanent Own Infrastructure:** Connectivity Cost will be under Project Funding (Government, Collaboration, Direct Grants or others).
- ☐ **Rented Infrastructure:** Institutions Scope to Manage Connectivity Cost.

Projected Number of Members

Member Institutions	June-18	Addition Y2018	EoY-18	Y2019	Y2020	Y2021	Y2022	Y2023
Public Universities	34	-	34	40	40	40	40	40
Private Universities	3	11	14	20	30	40	50	60
International Universities	1	1	2	2	2	2	2	2
Research Institute	2	8	10	10	10	10	10	10
Govt. Medical College	-	12	12	15	20	25	30	30
Semi Private Medical College	-	2	2	4	6	6	6	6
Private Medical College	-	1	1	4	14	24	34	44
Govt. College (District + Division)	-	-	-	-	18	38	58	78
Total Member Institutions:	40	35	75	95	140	185	230	270

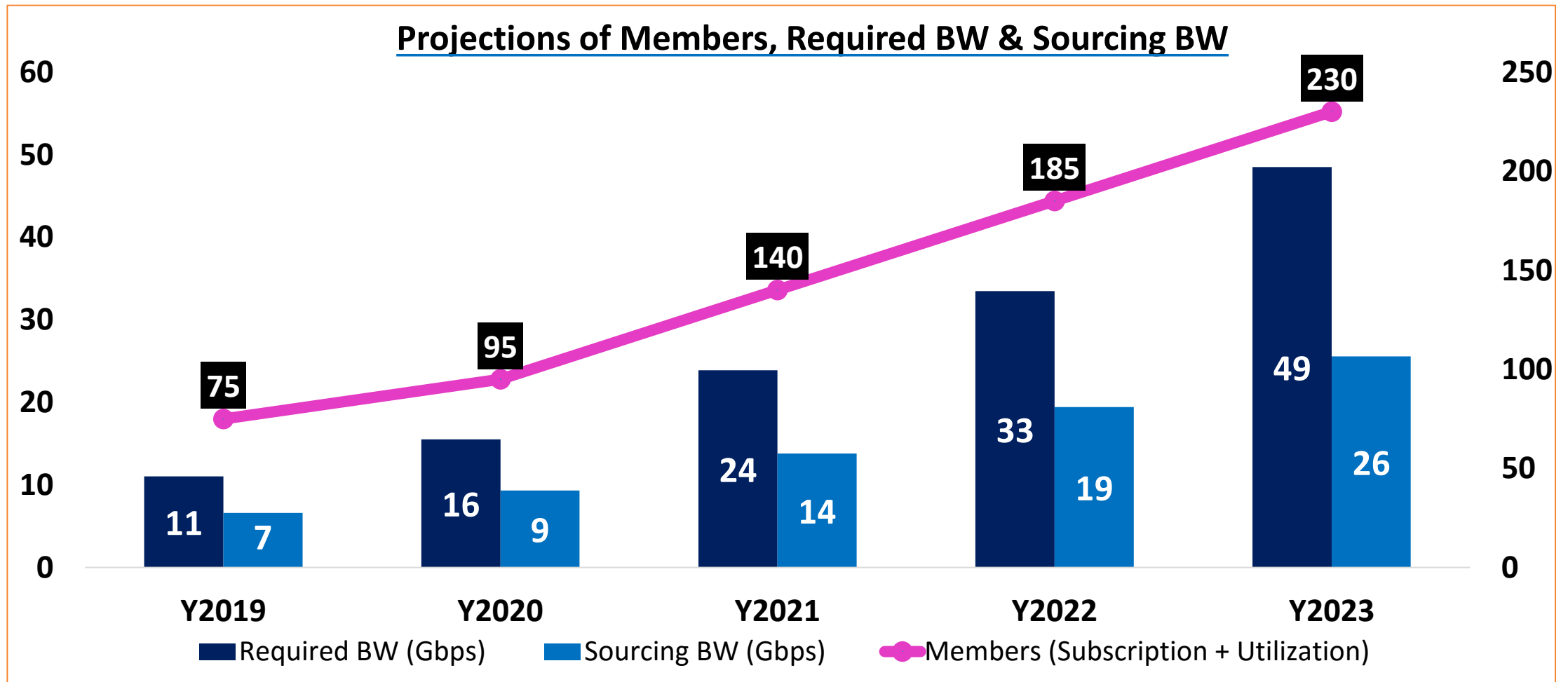
Bandwidth Projection (OpEx & Revenue calculation)

□ Assumptions: Bandwidth Requirement

(a) Baseline BW: Consumed BW as on June-2018

(b) Organic Growth: 5% per Quarter (22% Flat growth per year)

(c) BCN Growth: 50% in Q1-Y2019 and 20% in Q2-Y2019~Q4-Y2019



Services Roadmap of BdREN Trust

- ❑ Overall services of BdREN Trust has been redesigned into many measures for the member institutions to excel services of quality and sustainability.

Services of BdREN Trust	Y2018	Y2019	Y2020 ~ Y2023
Utilization-Based Services (Internet BW)	√	√	√
Subscription-Based Services (Packages)	√	√	√
Virtual Machine for Cloud Computing	√	√	√
Cloud Storage	√	√	√
Virtual Classroom using BdREN Video Conferencing System		√	√
Backup as a Service (BaaS) – Cloud Backup		√	√
BCN Project (19 Universities)		√	√
IP Telephony (ON-Net & OFF-Net) -Partnering with IPTSP			√
uSoftware and ePayment Process for Member			√
Active Capacity Lease out (Partnering with PGCB)			√
Professional Training (ICT, Project Management etc.)			√

Tariff Structure of BdREN

❑ Services of BdREN Trust to be attainable for the member institutions through basically two charging models:

- Subscription-Based charging model for Public Universities
- Utilization based-Based charging model (Others)

❑ Utilization-Based charging model : Internet Bandwidth

Data Package	Bandwidth Per Month	Price Per Mbps(BDT)	VC Hour			
			VC Hour per Month	IPv4 Address	Web Hosting	Eduroam
Premium	> 1Gbps	450	120	8	Free	Free
Gold	> 600Mbps ≤ 1Gbps	500	90	8	Free	Free
Silver	> 300Mbps ≤ 600Mbps	550	60	8	Free	Free
Standard	≤ 300Mbps	600	30	8	Free	Free

❑ Utilization-Based charging model : VM for Cloud Computing

Packages (Cloud VM)	Processor Price / Unit		RAM Price / Unit		HDD Price / Unit	
	Capacity	CPU / month	Capacity	GB / month	Capacity	GB / month
Tiny	≤ 04 CPU	2,001 BDT	≤ 08 GB	1,001 BDT	≤ 05 TB	3.5 BDT
Super	≤ 08 CPU	1,500 BDT	≤ 16 GB	750 BDT	≤ 10 TB	3.0 BDT
Jumbo	≤ 16 CPU	1,200 BDT	≤ 32 GB	600 BDT	≤ 30 TB	2.75 BDT
Titanic	> 16 CPU	1,000 BDT	> 32 GB	500 BDT	> 30 TB	2.50 BDT

❑ Utilization-Based charging model : Cloud Storage

Cloud Storage	Price (BDT) per GB per Month
upto 10 TB	3.0
upto 30 TB	2.5
above 30 TB	2.0

❑ Free of Cost Services for Members : Mail & Web Hosting, DNS Service

❑ Subscription-Based charging model : 3 Packages as per Shareholder Vetting

List of Services	Package-A	Package-B	Package-C
Internet Bandwidth (Maximum)	1,000 Mbps	600 Mbps	400 Mbps
TEIN Bandwidth	Included	Included	Included
Intranet	Included	Included	Included
Virtual Machine (VM) Services	144-Core Month 288-GB Month RAM 180-TB Month HDD	96-Core Month 192-GB Month RAM 120-TB Month HDD	72-Core Month 144-GB Month RAM 96-TB Month HDD
Video Conference Facility	Unlimited (Subject to resource availability)		
Mail Server Hosting	Included	Included	Included
Web Server Hosting	Included	Included	Included
Domain Name System (DNS) Hosting Services	Included	Included	Included

❑ **Subscription-Based charging model:** Mapping between Member Universities and Packages which variables are-

- ▣ Number of Teachers
- ▣ Number of Students
- ▣ Consumed Bandwidth by the member universities (BdREN + 3rd Party services)

❑ **Subscription-Based charging model:** Packages Distribution and Valuation

Packages	No. of Universities	Package Valuation (BDT)	Offered Package Value (BDT)
Package - A	04	738,000	400,000
Package - B	08	492,000	300,000
Package - C	22	385,000	200,000

❑ SWOT Analysis with respect to Competitors (ISP and Facility Providers)

❑ Strength:

- Recognition by Ministry of Education, GoB and Member Institutions as a viable NREN model.
- An established cost-effective and innovative national educational and research network.
- Multi-Services Platform which rare in ISP-
 - Bandwidth (Commercial Internet, Academic Intranet, Research BW through TEIN).
 - Virtual Machine for Cloud Computing.
 - Virtual Classroom using BdREN Video Conference System.
 - ON-Net Communication among the member groups (Files Transfer, IP-Telephony, IP-PABX and many more).

SWOT Analysis with respect to Competitors (ISP and Facility Providers)

Weakness:

- Less engagement of students in the established networks.
- Awareness gap for the audiences about BdREN activities.
- Realization gap for the members which outcome is non effective utilizations.
- Lower ICT investment for the new member acquisition.
- Limited ICT Funding.
- BdREN internal revenue generation are limited due to slow connectivity of member institutions.
- Weak and inadequate linkages with strategic industry partners.

❑ SWOT Analysis with respect to Competitors (ISP and Facility Providers)

❑ Opportunities:

- Collaborating partners such as NORDUnet, TEIN, BCC, PGCB, MoE (GoB) Ministry of Information and Communication have supported BdREN.
- BdREN has the active fiber spares capacity which can be leased to the NTTN and Telecom operators to promote revenue streams.
- Students Fees through eCommerce platform
- IP-Telephony for ON-Net and OFF-Net services.

❑ Threads:

- Commercial Internet BW cost high due to single source.
- Limited ICT Budget for targeted institution.
- Low penetration of connectivity for remote and rural areas.
- Some ISPs consider BdREN a competitor.
- A common threat to ICT systems in Bangladesh is the unavailability or poor reliability of commercial power.

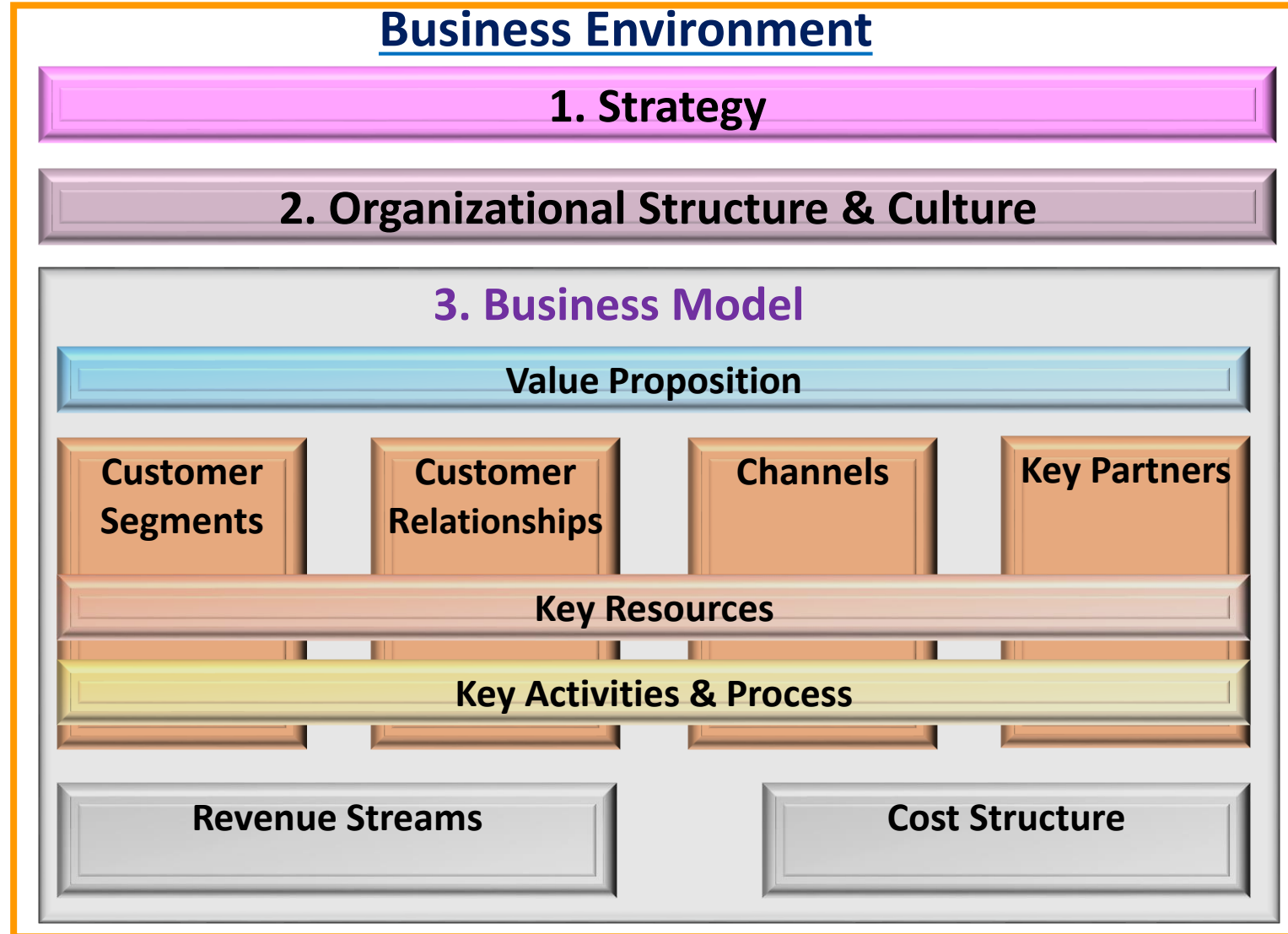
Financial Sustainability of BdREN

Contextual Sustainable Business Model

A. Business Environment has three pillars which performance resulting in overall Organizational sustainability :-

1. Strategy
2. Organizational Structure & Culture.
3. Business Model (9-Component)

B. Revenue Streams and Cost Structure are the pillar of financial aspects resulting in Economical Sustainability.



Policy Issues : Sustainability Workshop (9 April, 2018)

- ❑ 84 participants were requested to focus on the following key policy issues in their discussion and present the recommendations from the Group by the Chair of the respective group among six (06) groups:

- ❑ **Financial Model (Policy-01):**

1. Capital Expenditures from GoB source - GoB Responsibility
2. Operational Expenditure from User source - BdREN Trust Responsibility

- ❑ **Charging Model (Policy-02):**

1. Subscription-based charging (for 4 different packages): Public Universities
2. Utilization based charging: Private Universities & Others Institutions

- ❑ **Payment Model (Policy-03):**

1. UDL Payment mode (Collection of Subscription Fees at source in UGC) for Public Universities
2. Invoice Mode for Private Universities & Other Institutions

- ❑ **Realistic Investment Plan (Policy-04):**

1. 4 Plans or any other mix
2. Risk factors analysis and recommendation for endowment fund

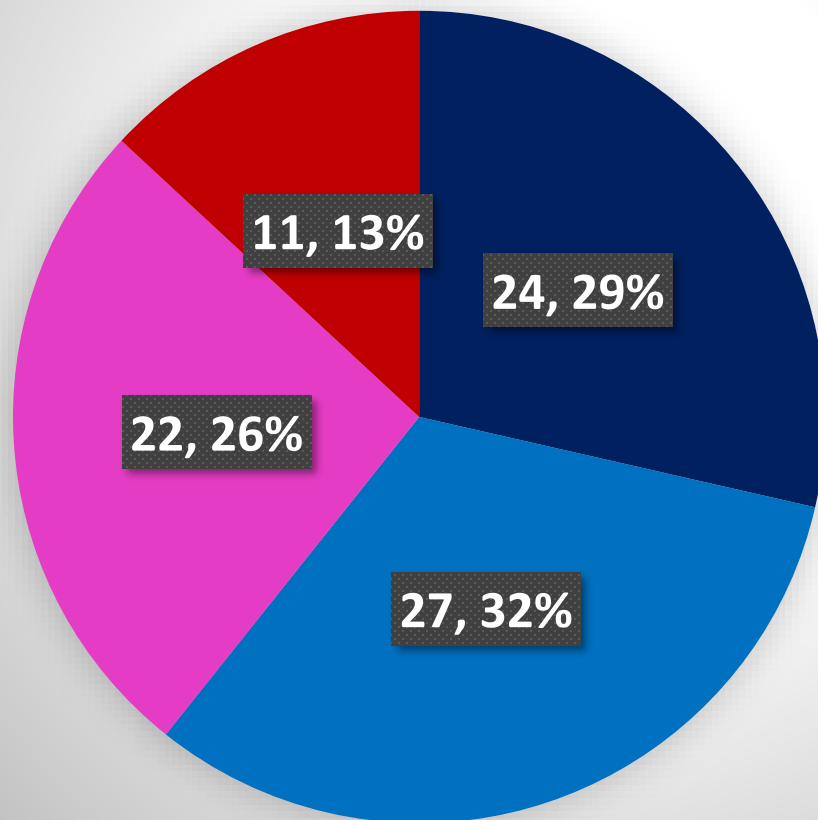
- ❑ **Increase of Membership Fees (Policy-05):**

1. Increment plan from BDT 25,000 to higher

Participants and Group-Chairs : Sustainability Workshop (9 April, 2018)

84 Attendees

- Vice-Chancellor / Pro Vice-Chancellor
- Registrar / Deputy Registrar
- Treasurer / Controller
- Others



Group

Group-Chair

Padma

VC, University of Barishal

Meghna

VC, Shahjalal University of
Science and Technology (SUST),
Sylhet

Jamuna

Registrar, National University,
Gazipur

Surma

VC, Sylhet Agricultural University
(SAU)

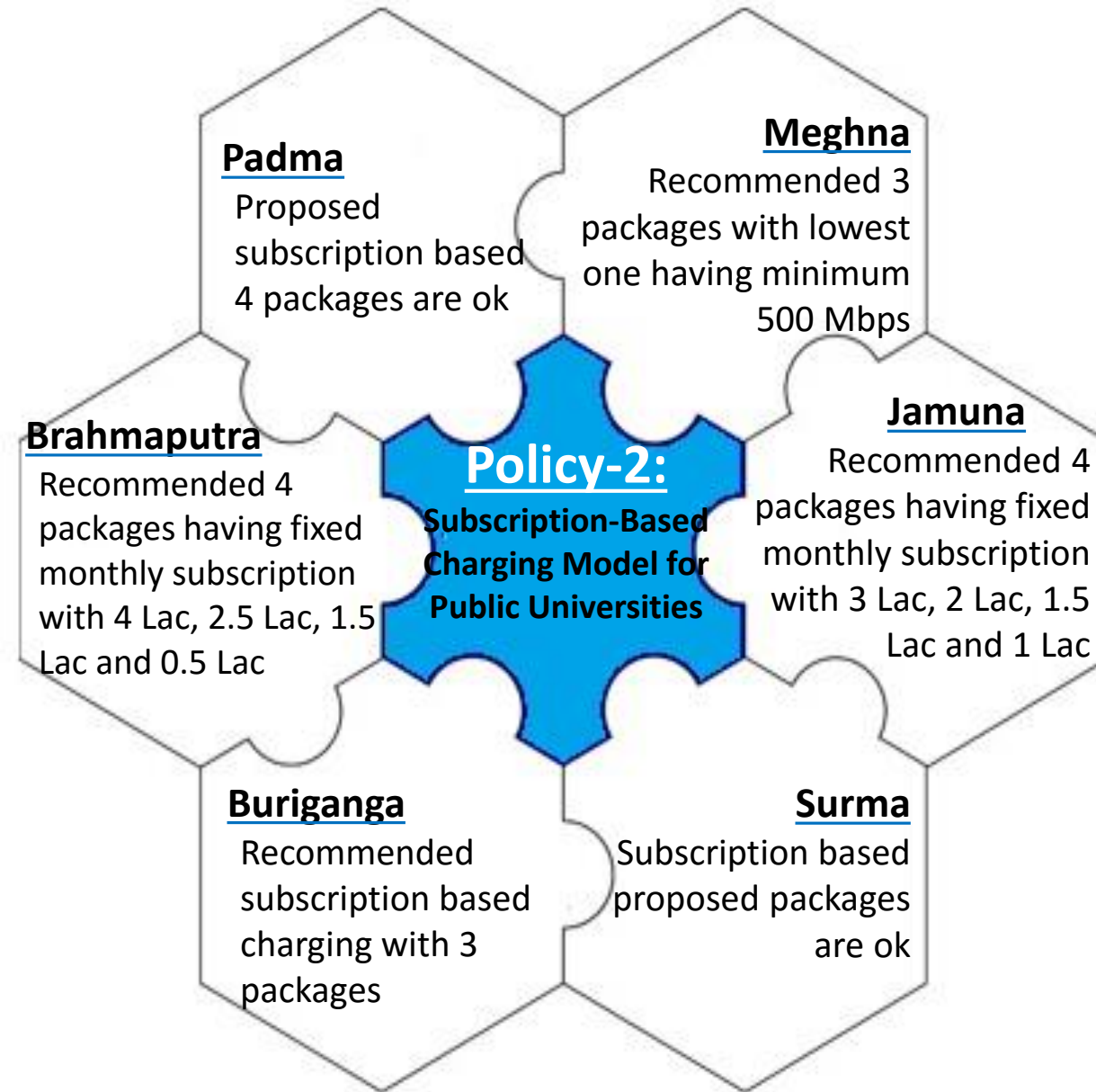
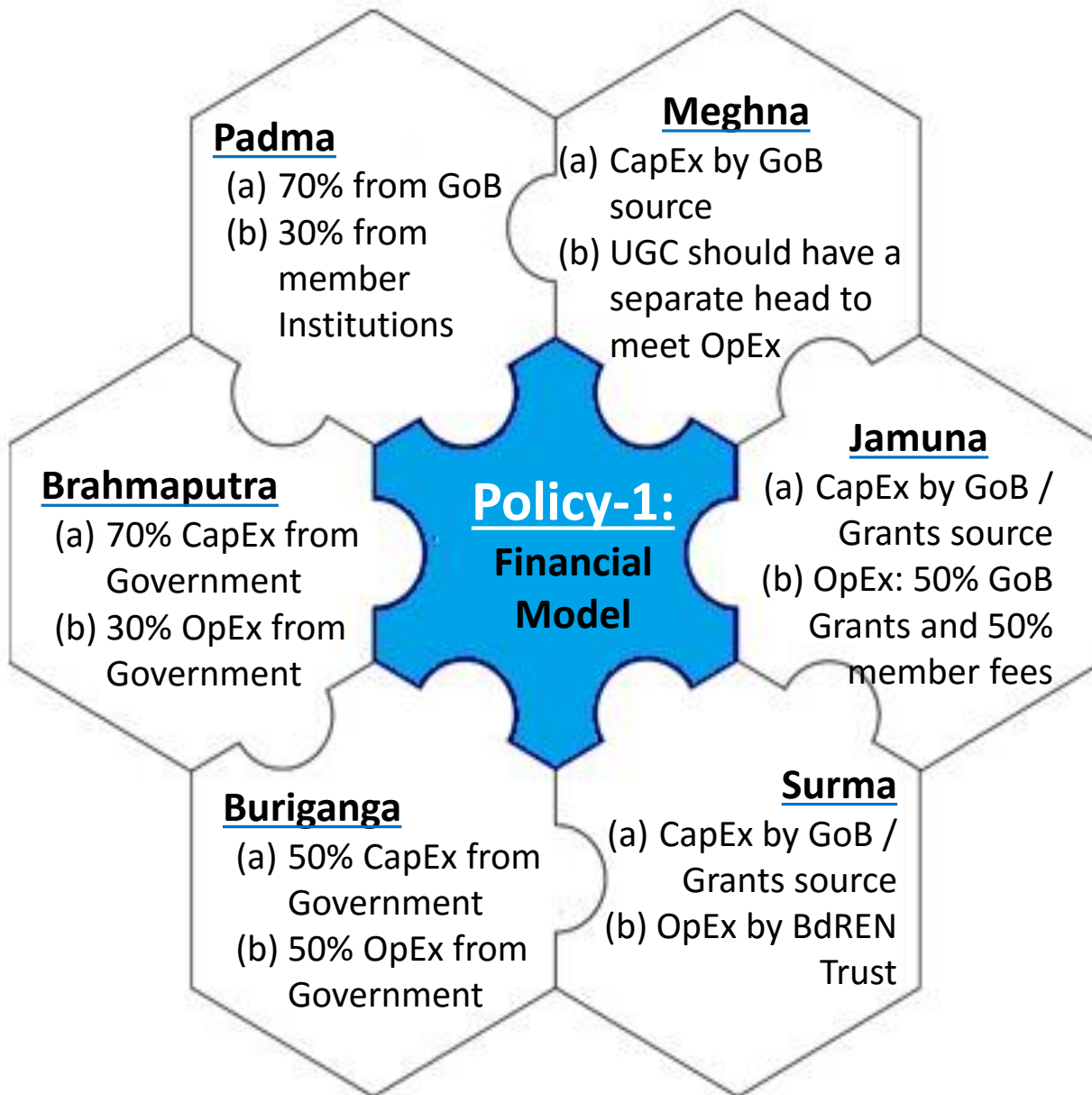
Brahmaputra

VC, Sher-e-Bangla Agricultural
University (SBAU), Dhaka

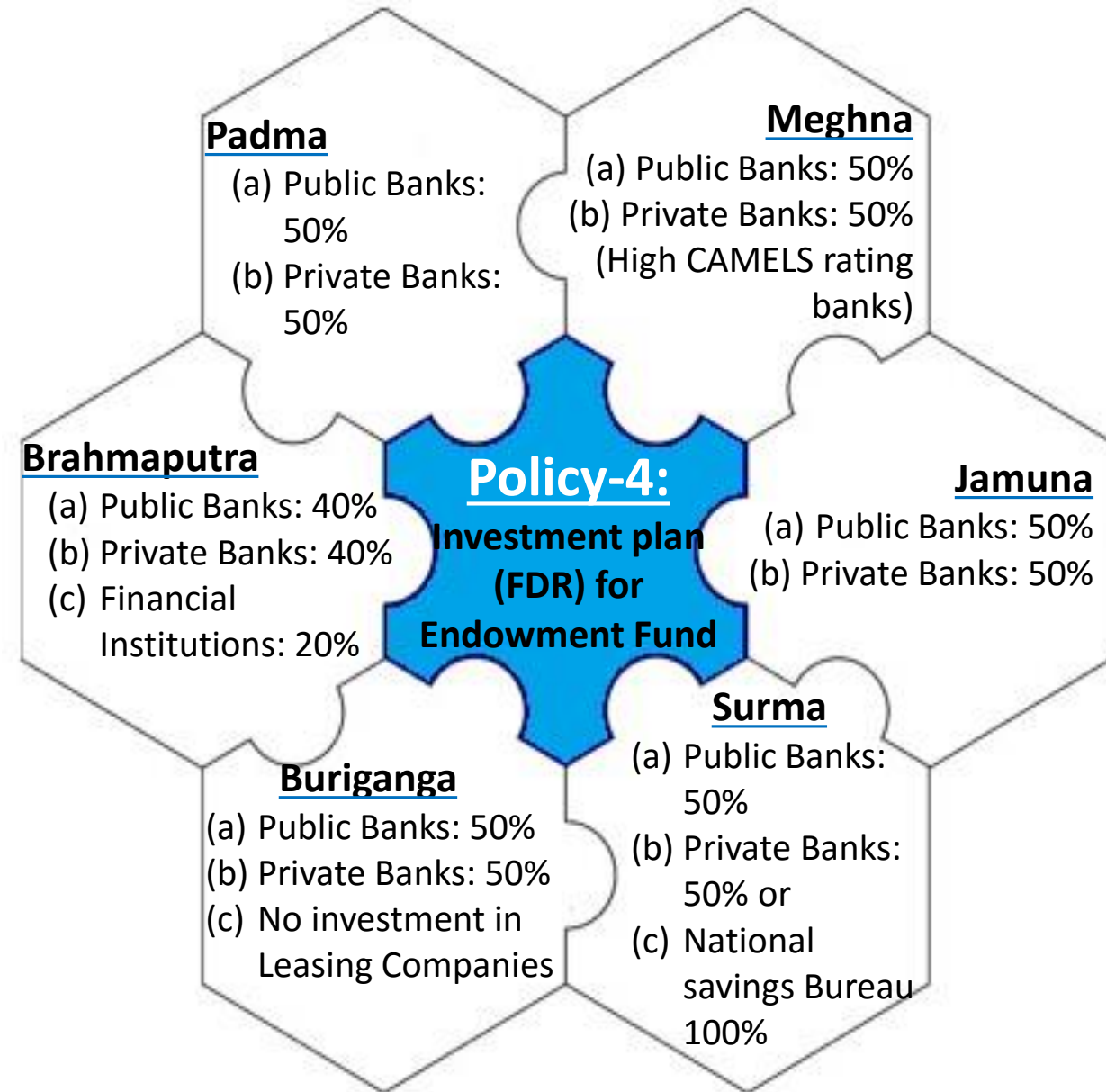
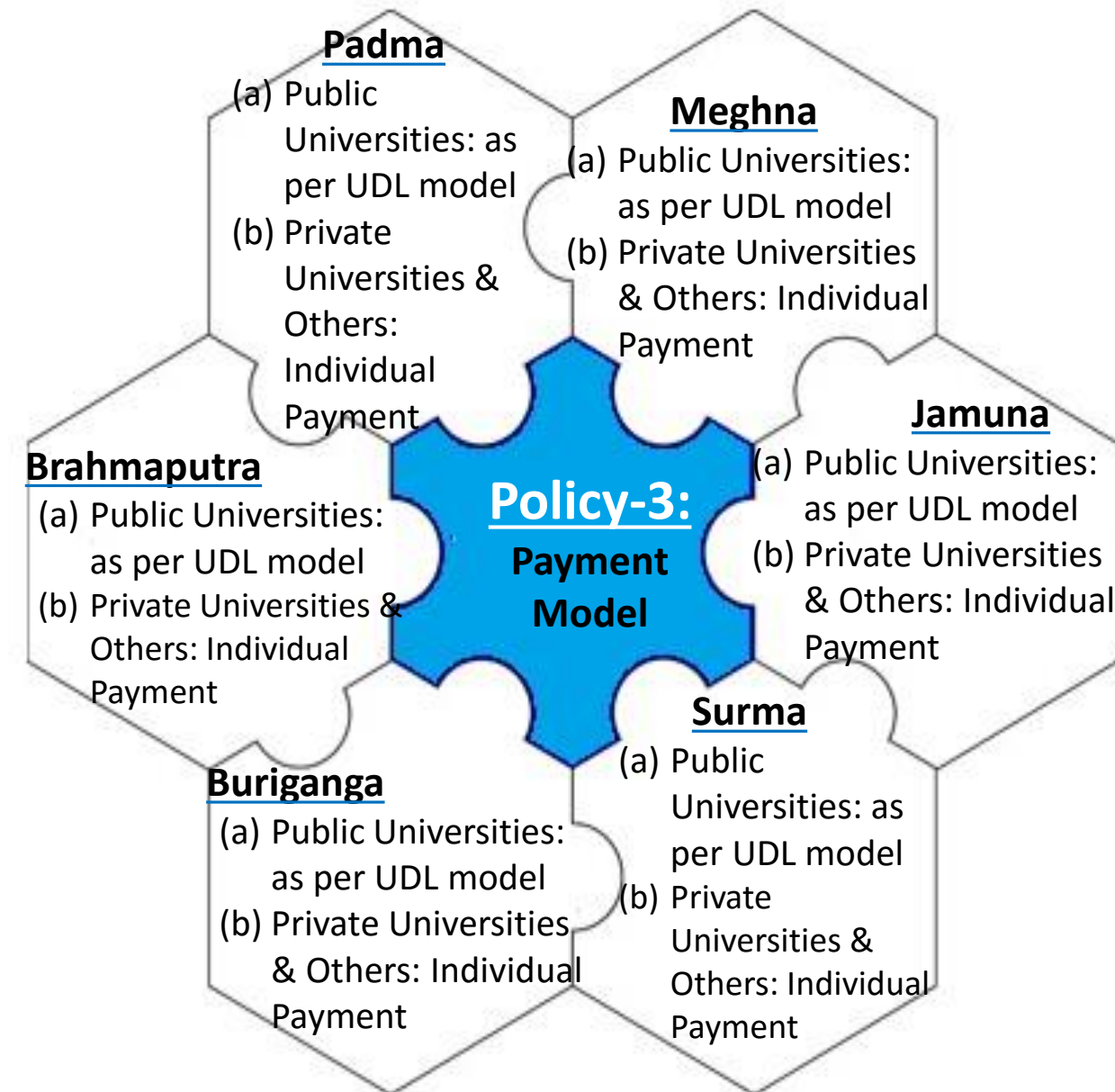
Buriganga

VC, Begum Rokeya University,
Rangpur

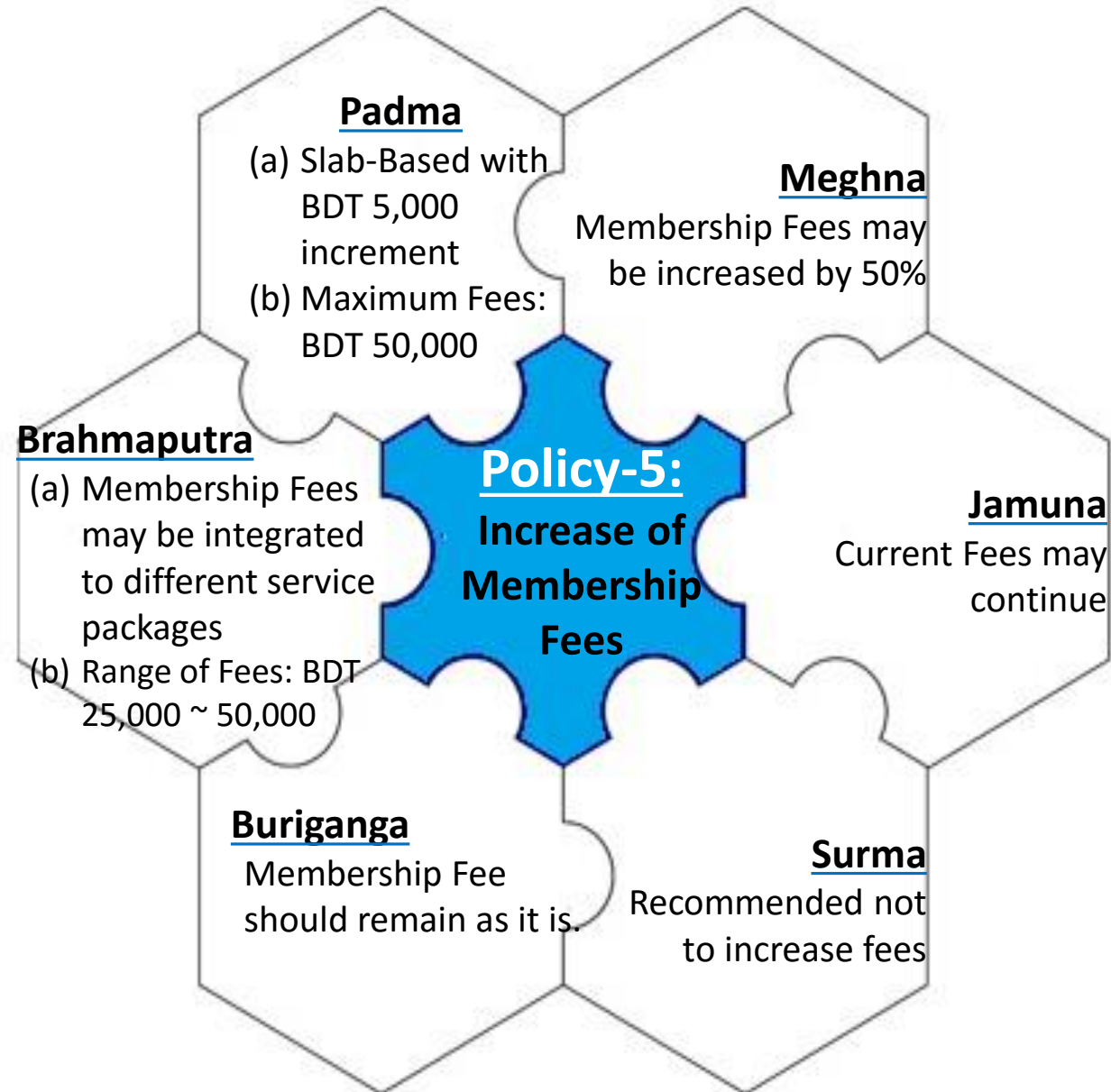
Key Recommendations (1/3): Sustainability Workshop (9 April, 2018)



Key Recommendations (2/3) : Sustainability Workshop (9 April, 2018)



Key Recommendations (3/3): Sustainability Workshop (9 April, 2018)



Key Recommendations for Policy : Discussion Minutes

- ❑ After Group Presentations, the participants were unanimously agreed on the following key policy issues through an open discussion:

FINANCING MODEL

- (a)** Re-Investment source for Network Modernization: Direct Grants / GoB Fund
(b) New Member Institutions connectivity: Direct Grants / GoB Fund / Concerned Institutions.

CHARGING MODEL (Public Universities)

- (a)** Subscription based with 3 packages having value of 4, 3, 2 Lac per month.
(b) Minimum bandwidth 500 Mbps

PAYMENT MODEL

- (a)** Public University: as per UDL model
(b) Private University & Others: Individual payment.

ENDOWMENT FUND

(Investment Plan)

- (a)** Public Banks: 50%
(b) Private Banks: 50%

MEMBERSHIP FEE

Membership Fees will be increased from BDT 25,000 to 35,000

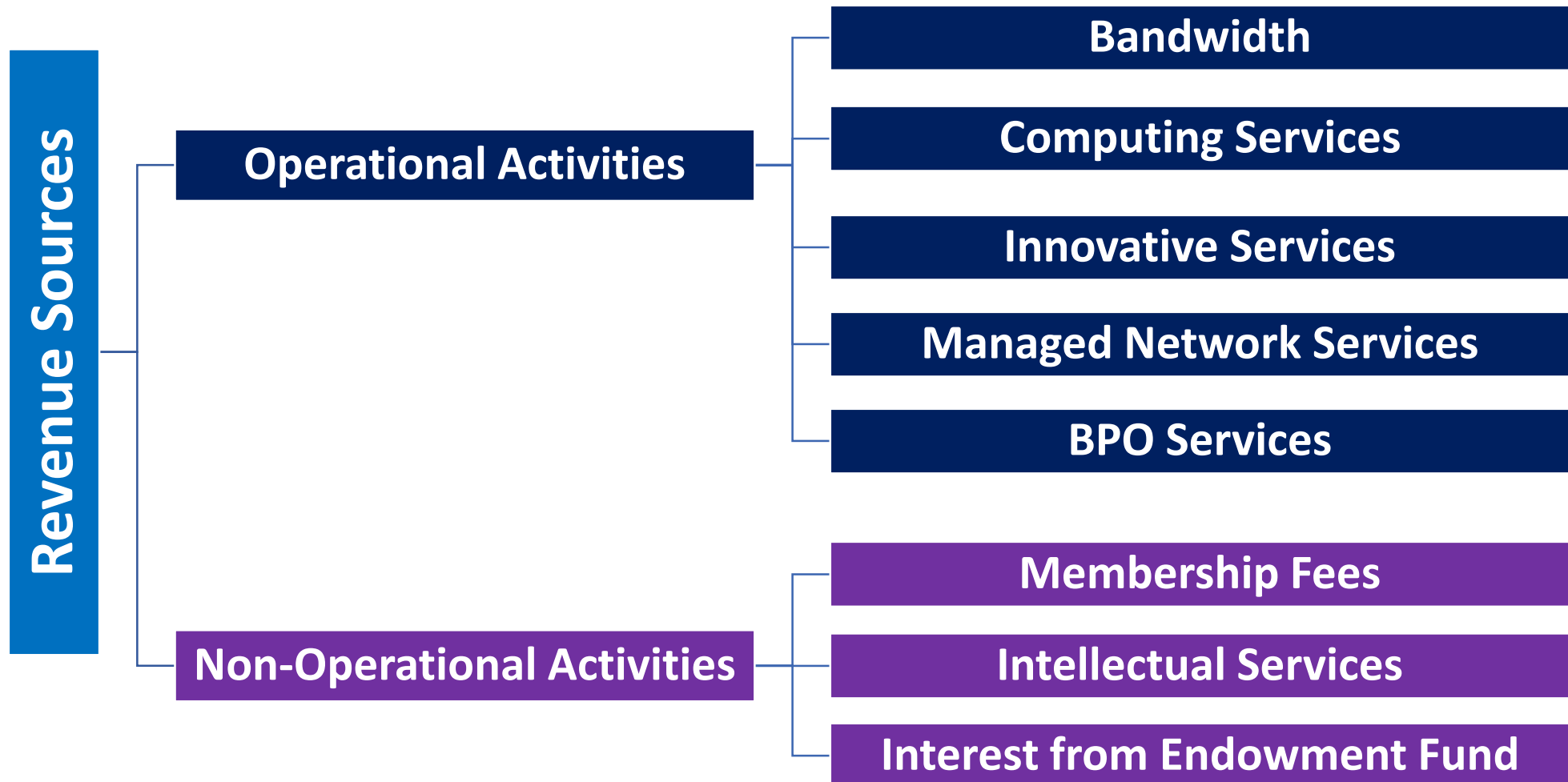
OTHERS

Introduce some Value-Added Services in Phases:

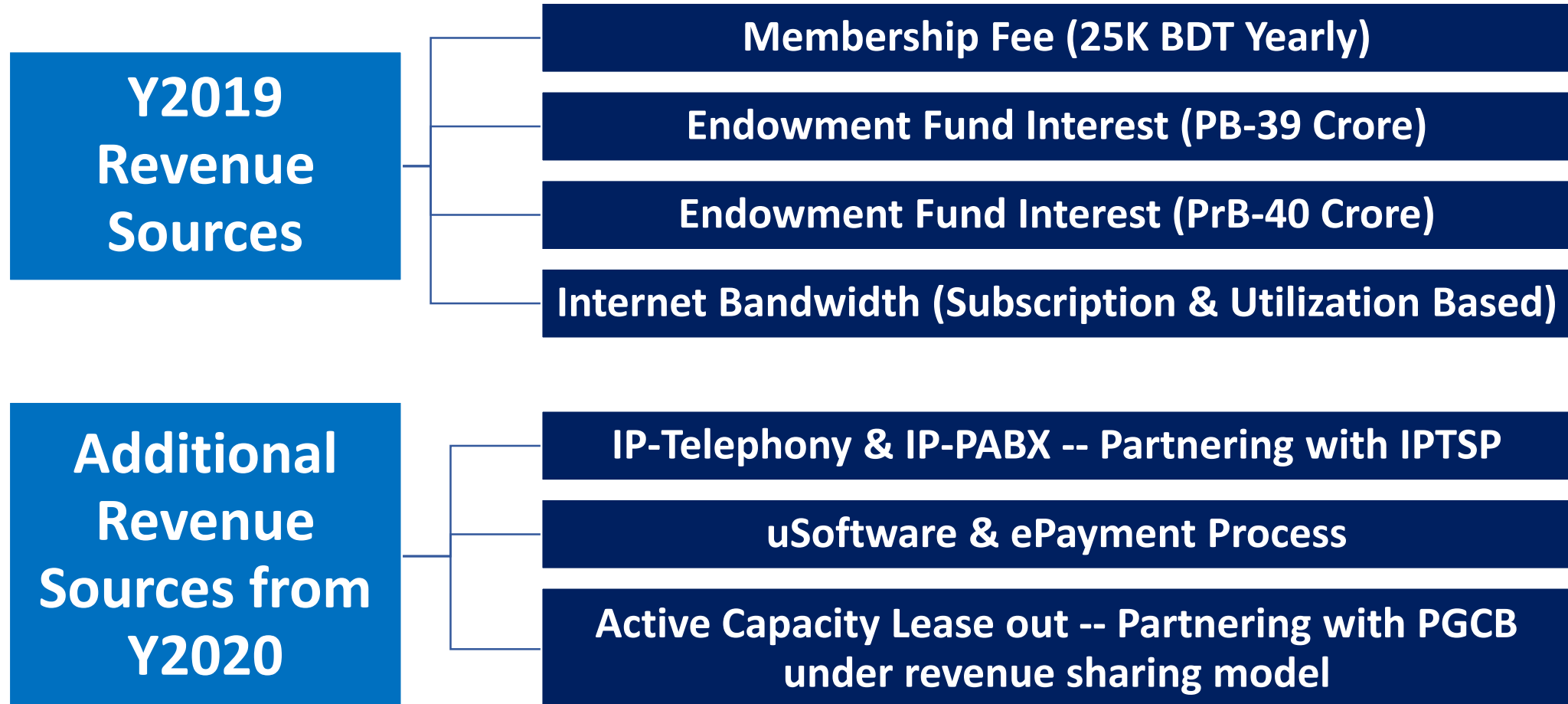
eCommerce Payment System, Unified Education Resource Management, Admission Process Hosting etc.

Revenue Streams of BdREN For Financial Sustainability

Sources of Revenue Streams (Activity-based Plotting)



Revenue Sources : Y2019 and Upwards



Planning of Endowment Fund Management to enhance Revenue

❑ Investment in FDR (3 Types of Financial Sectors):

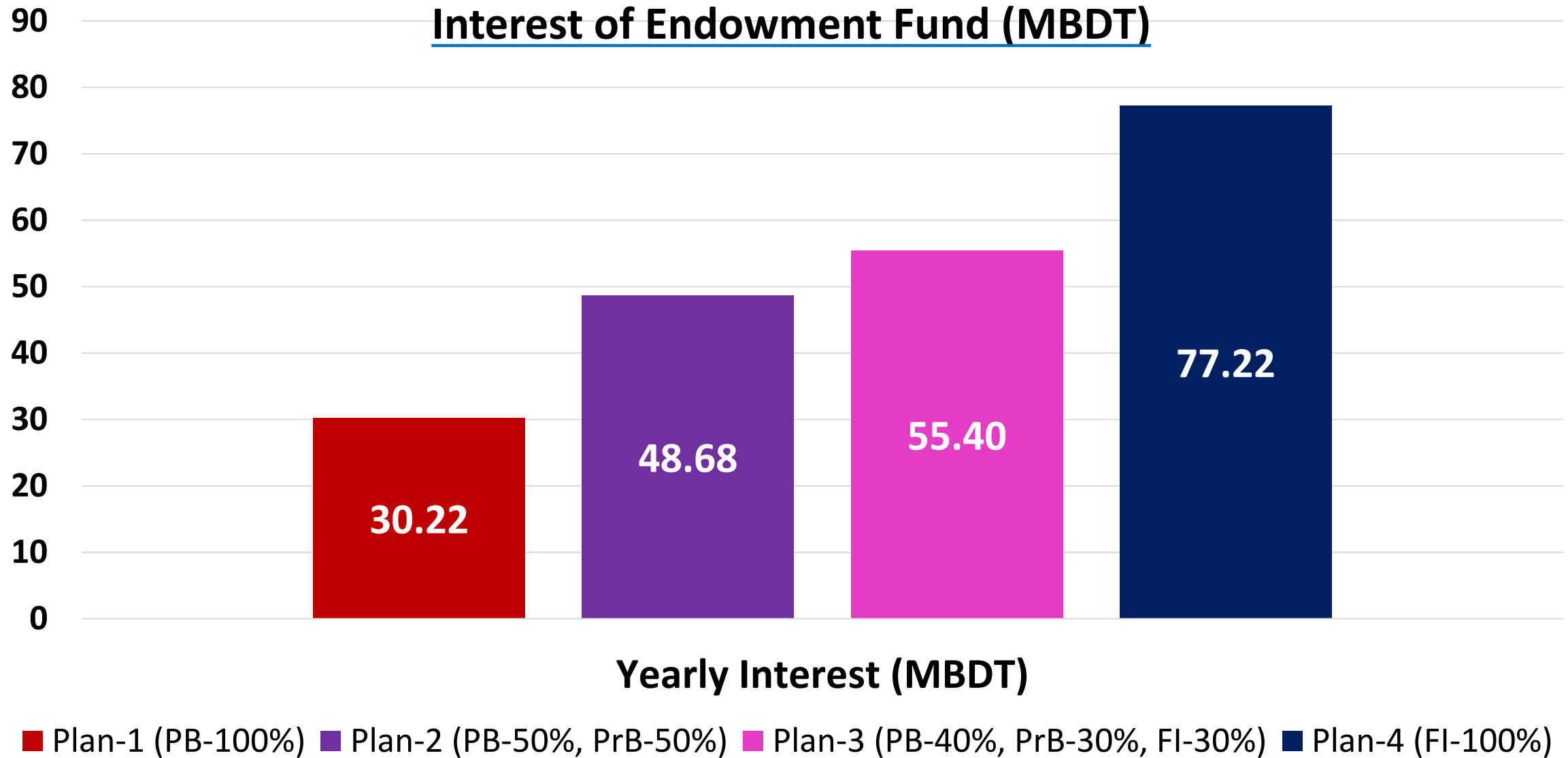
1. **Public Banks (PB)** - Low Interest Rate (Avg. IR 5%)
2. **Private Banks (PrB)** - Medium Interest Rate (Avg. IR 10%)
3. **Financial Institutions (FI)** - High Interest Rate (Avg. IR 11.5%)

❑ Investment Plans of Endowment Fund (BdREN Trust – 79 Crore BDT)

4 Plans have been taken into consideration for sanity analysis and for picking out the best plan by the Board of Trustees:

1. **Plan-1:** 100% in Public Banks (PB-100%)
2. **Plan-2:** 50% in Public Banks (PB-50%) and 50% in Private Banks (PrB-50%)
3. **Plan-3:** 40% public Banks (PB-40%), 30% private Banks (PrB-30%), 30% Financial Institutions (FI-30%)
4. **Plan-4:** 100% in Financial Institutions (FI-100%)

Interest of Endowment Fund : 4 Plans for Sanity Analysis

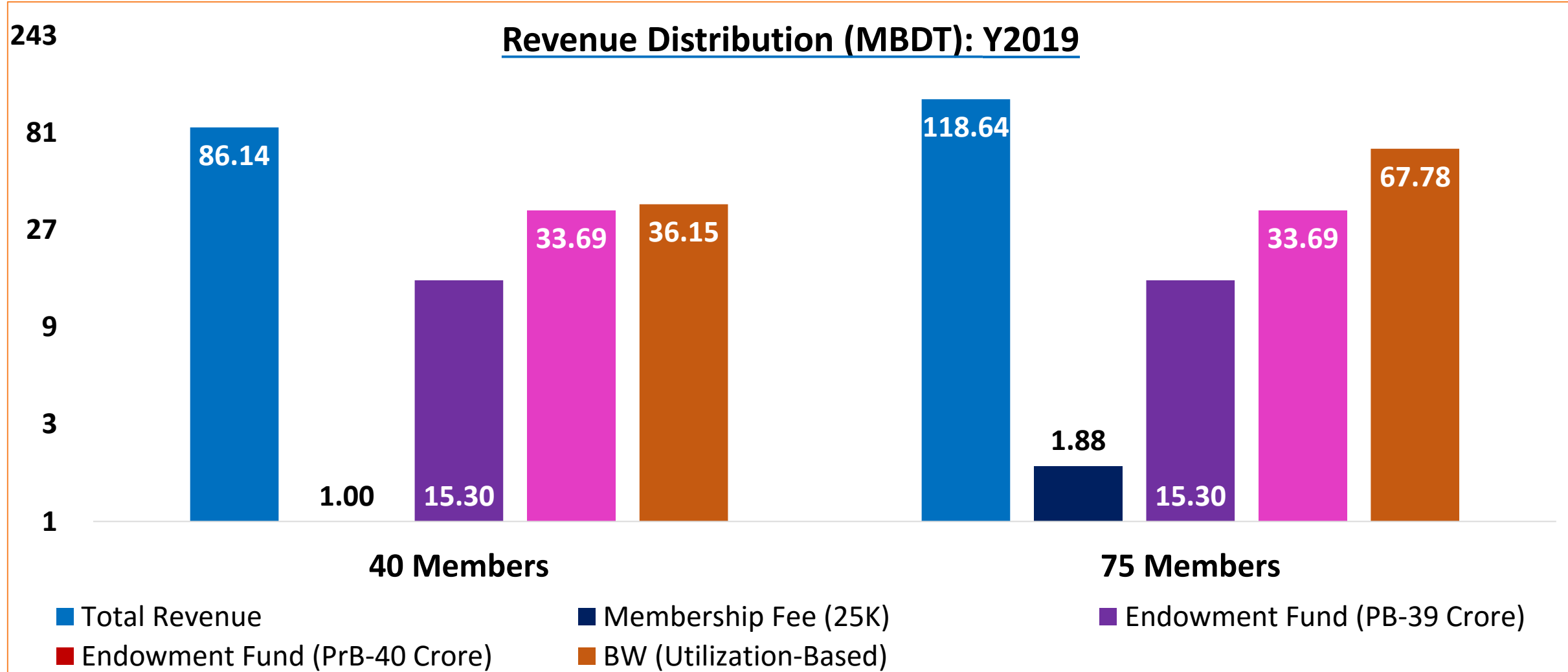


Revenue Distribution : Utilization Based Services (Current Practice)

Assumptions:

(a) Membership Fee – BDT 25,000

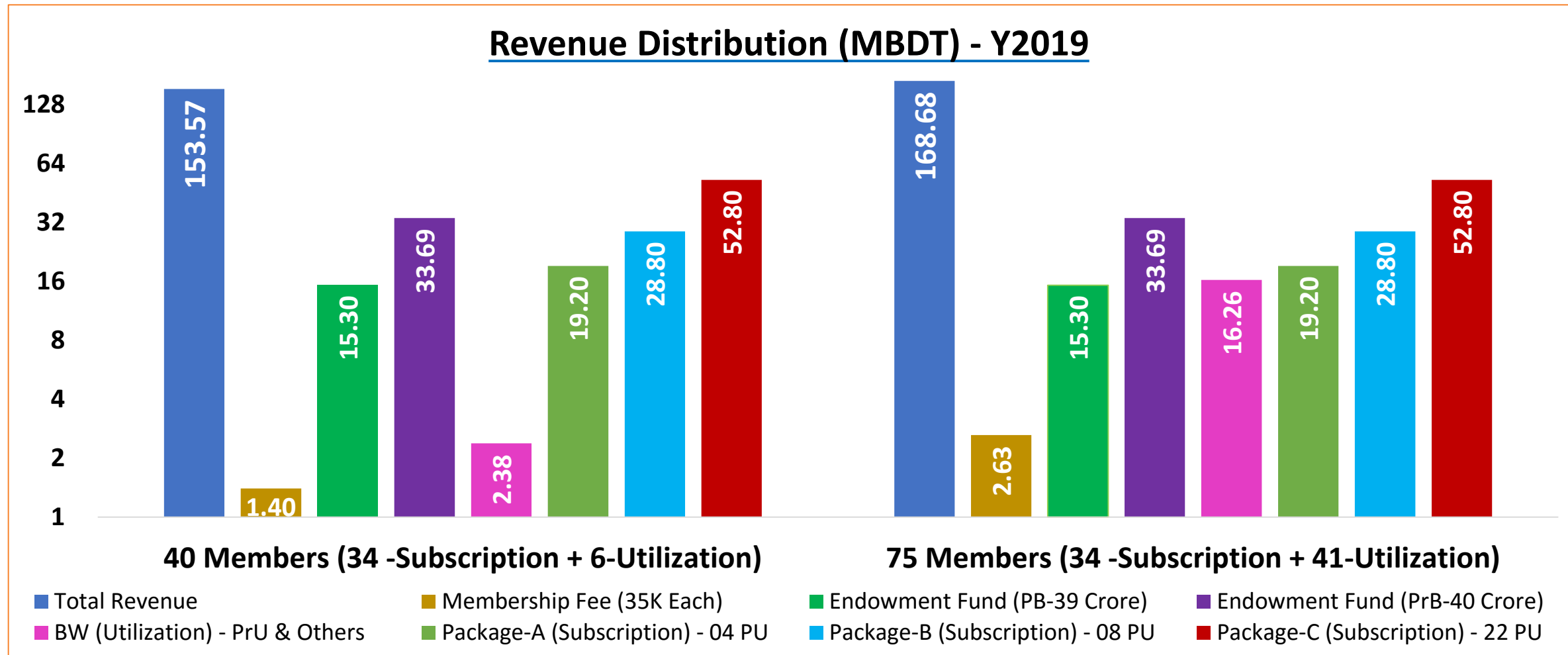
(b) Endowment Fund – FDR 50% in Public Banks & FDR 50% in Private Banks



Revenue Distribution : Subscription & Utilization Based Charging Model

Assumptions:

- (a) Membership Fee – BDT 35,000
- (b) Endowment Fund – FDR 50% in Public Banks & 50% in Private Banks
- (C) Package-A: BDT400,000, Package-B: BDT300,000, Package-C: BDT200,000

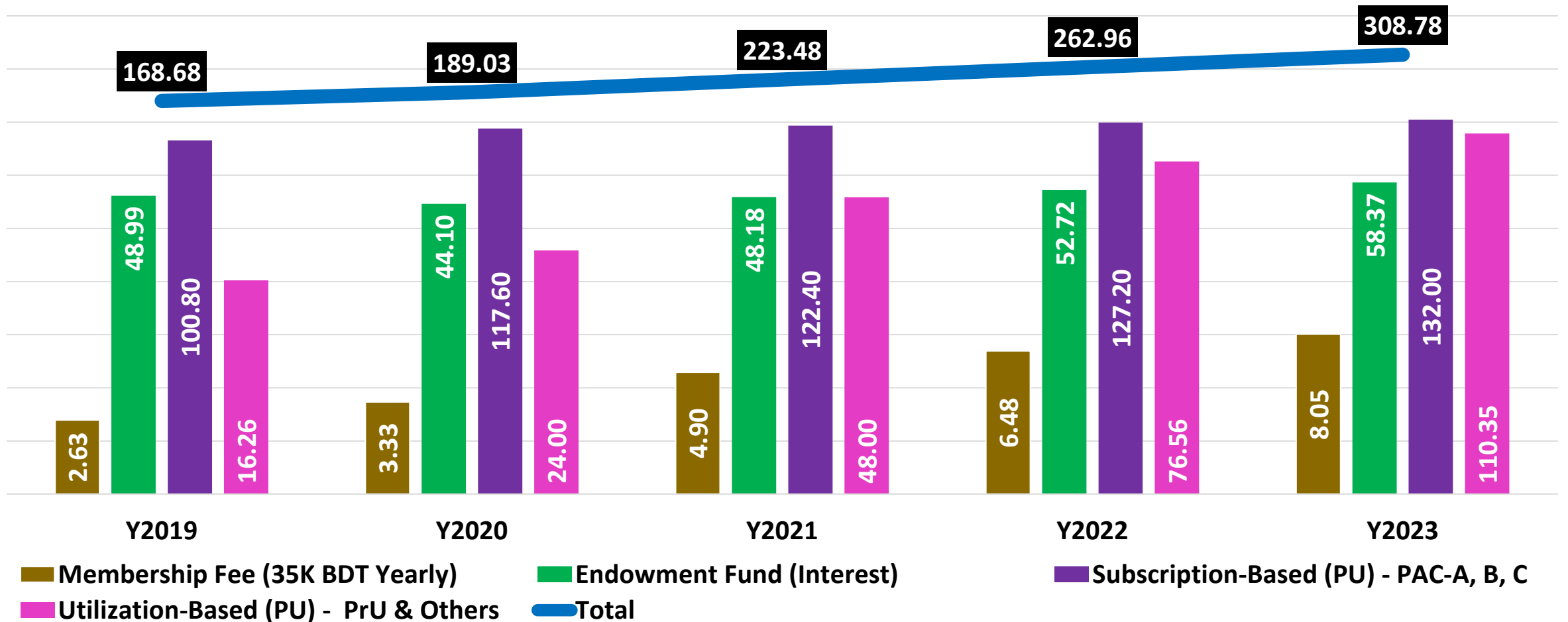


Revenues : Basic Services

Assumptions:

- (a) Subscription-Based Charging Model for Packages (A, B, C) – 34~40 Public Universities
- (b) Utilization-Based Charging Model – 41~190 Private Universities and other Institutions

Revenue Distribution (MBDT) : Y2019-Y2023

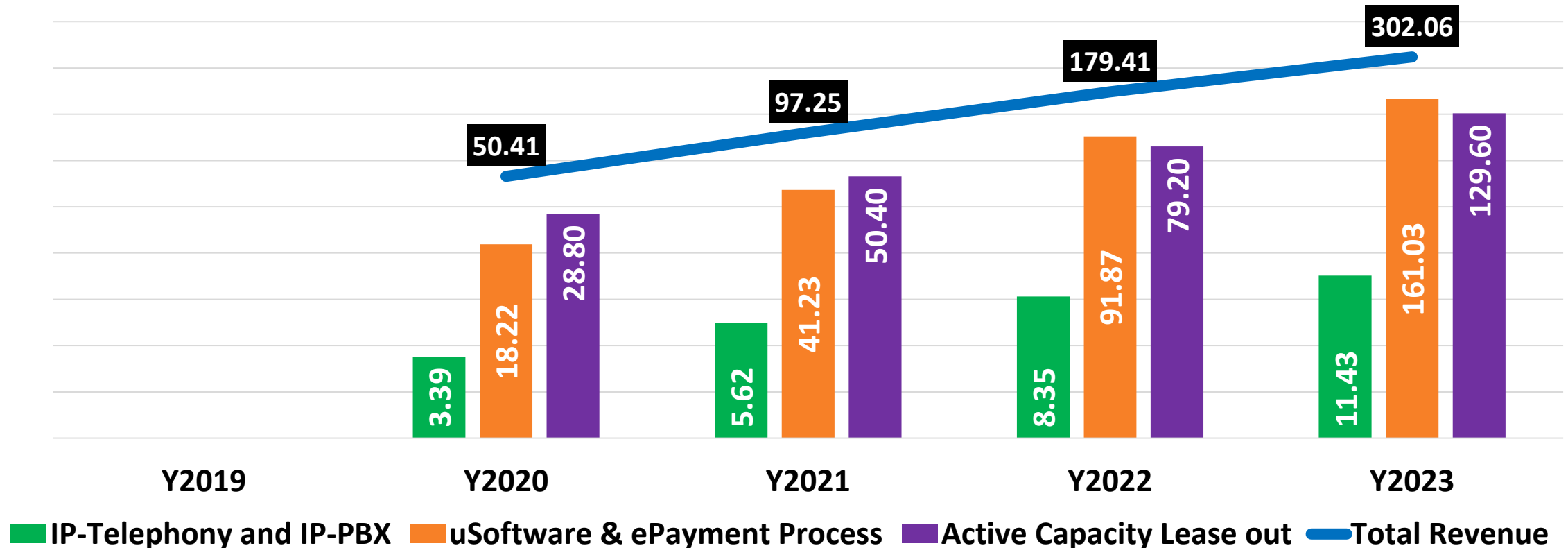


Revenues : Application & Infrastructure Services

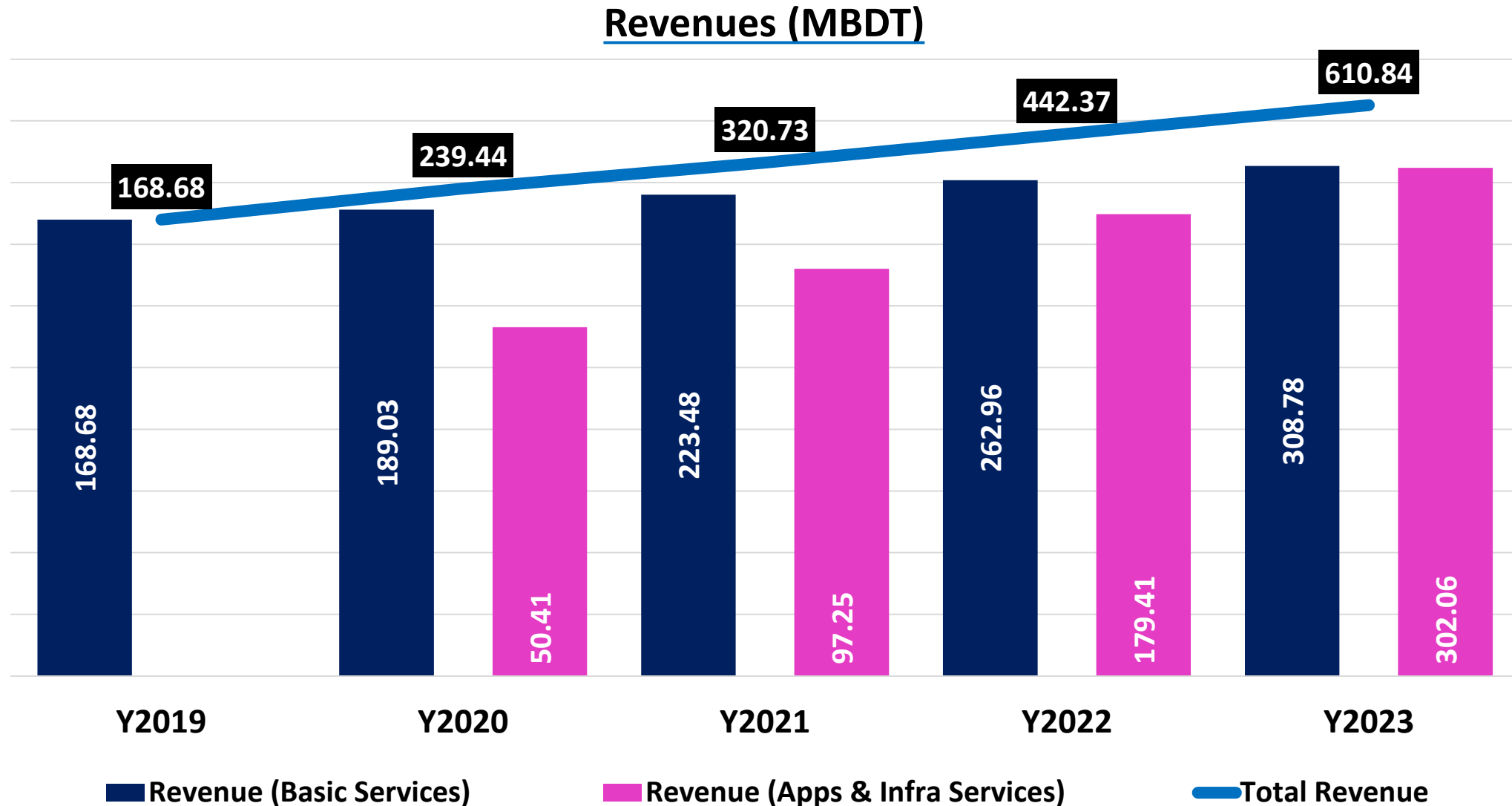
□ Assumptions:

- (a) IP-Telephony & IP-PABX -- Partnering with IPTSP
- (b) uSoftware & ePayment Process -- Revenue sharing with member institutions
- (C) Active Capacity Lease out -- Partnering with PGCB under revenue sharing model

Revenues (MBDT) - Application & Infrastructure Services



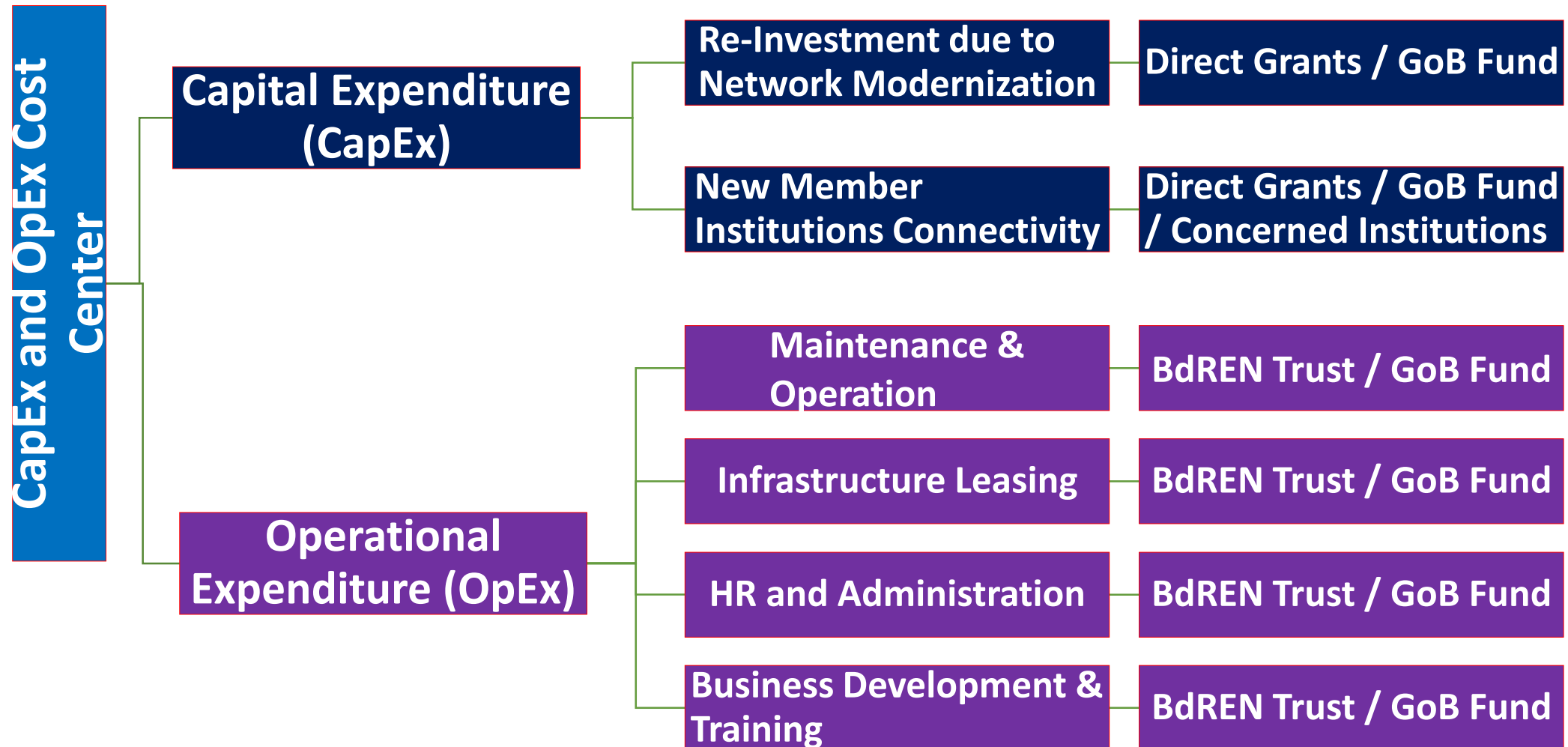
Revenue (Basic + Application & Infrastructure Services)



Expense Account of BdREN For Financial Sustainability

CapEx and OpEx Management to Sustain BdREN TRUST

(As per Stakeholders Vetting)



OpEx Components for BdREN Trust (1/3)

OpEx Group	OpEx List	OpEx Components
Infrastructure Leasing	Transmission Infrastructure Leasing	PGCB Charge (10% of IPLC)
		PGCB Charge (10% of Internet BW)
		Last Mile Fiber Maintenance (3rd Party)
	Internet Bandwidth	Private Universities & Others Organizations
		Public Universities
	PoPs Infrastructure and Utilities	Colocation Charges (10 PoPs)
		Utilities Charges (Electricity, Gas, Water etc.)
	DC and DR Infrastructure and Utilities	Data Center Electricity (UGC)
	BDIX Connectivity	BDIX Connectivity (Local IP Transit)

OpEx Components for BdREN Trust (2/3)

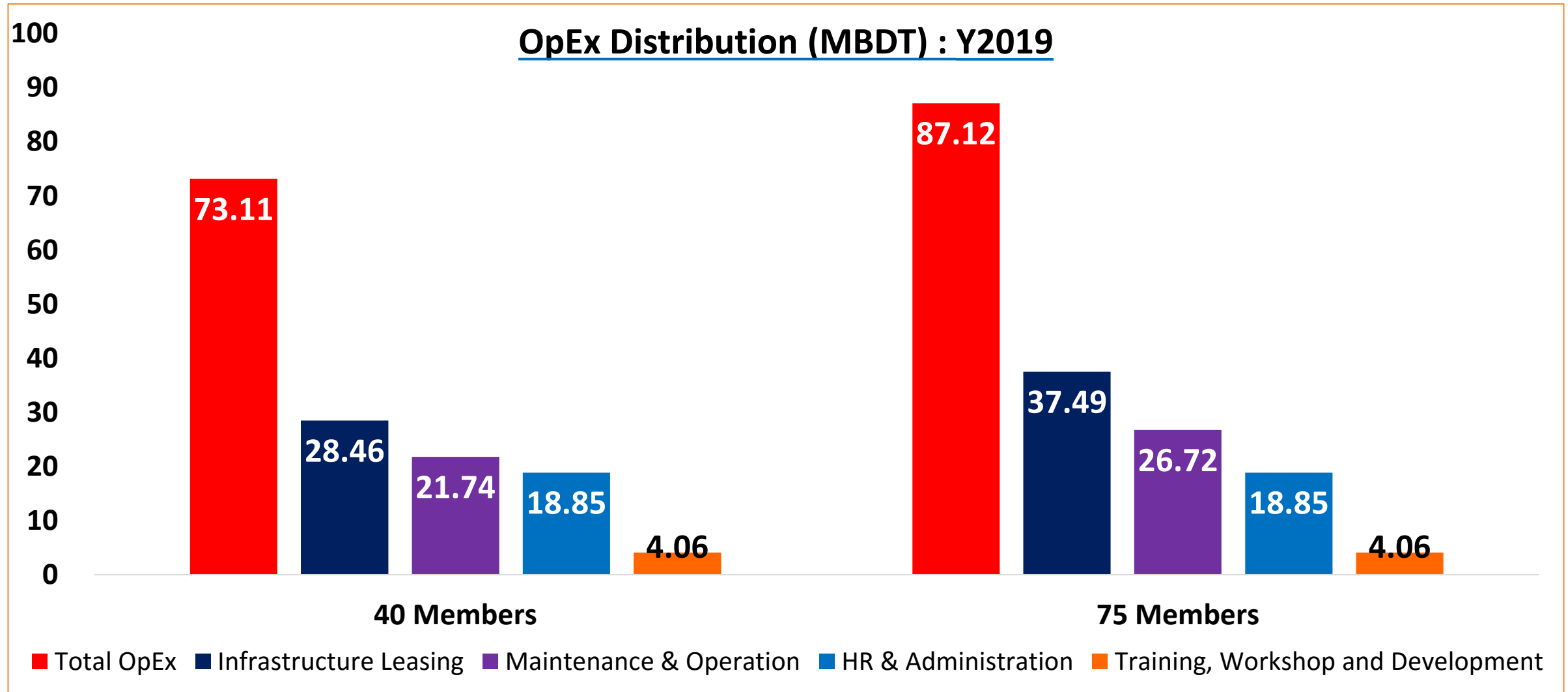
OpEx Group	OpEx List	OpEx Components
Maintenance & Operation	Equipment Maintenance & Spare Parts	Data Center Equipment (Software, Upgradation & Spare parts)
		Equipment at PoPs and Member Institutions (Software, Upgradation & Spare parts)
		Electrical Accessories (Spare parts for CB, SG, AC/DC Panels etc.)
		UPS (Spare parts & Maintenance)
		Generator (Spare parts & Maintenance)
		Rectifier (Spare parts & Maintenance)
		Fuel for Generator
	AC & PAC Maintenance	AC Maintenance
		Precision AC Maintenance
	Employee Travel	Transport fair during Travel
		Accommodation Cost
		Daily Allowance Cost
	Transport cost	Fuel (Inside Dhaka & Periphery for 4 Cars)
		Car Maintenance
		Renewal & Fitness Fees for Cars
		Insurance for Cars
	Office Utilities	Telephone
		Internet services
		Electricity
		Water
		Miscellaneous

OpEx Components for BdREN Trust (3/3)

OpEx Group	OpEx List	OpEx Components
HR & Administrative	Employee Salaries	Employee Salaries
		Overhead on Employee Salaries
	Audit and Legal Charges	Audit and Legal Charges
	Office Management	Entertainment, License, NOC, Agreement, stationary, printing, Courier & Postage etc.
Training, Workshop and Development	Training and Workshop	Training (Local)
		Training (Abroad)
		Workshop (Local Members)
		Workshop (Local + International Members)
	Business Development cost	Business Development cost

OpEx Distribution : Utilization Based Services (Current Practice)

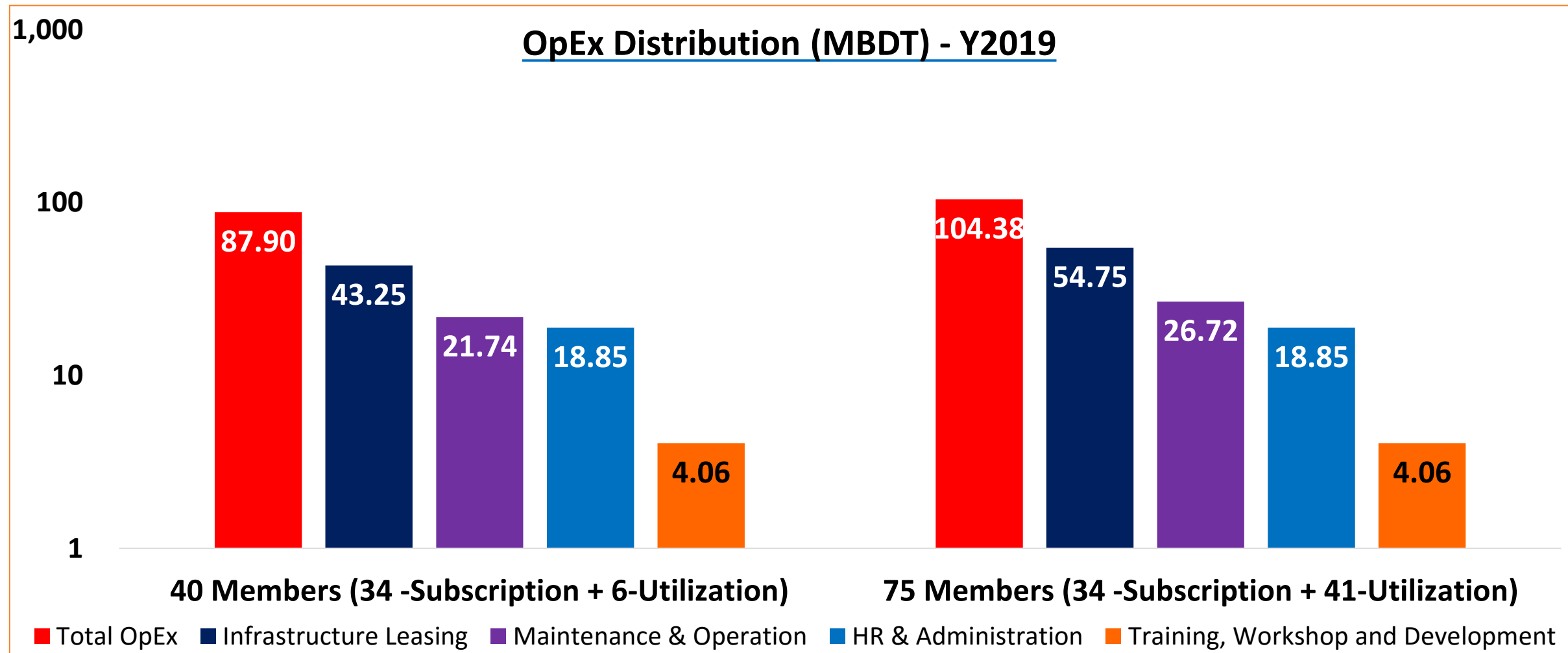
- OpEx are variable and which generally dependent on Categories of Services and Number of Members.



OpEx Distribution : Subscription & Utilization Based Charging Model

Assumptions:

- (a) Subscription-Based Charging Model for Packages (A, B, C) - 34 Public Universities
- (b) Utilization-Based Charging Model - 41 Private Universities and other Institutions

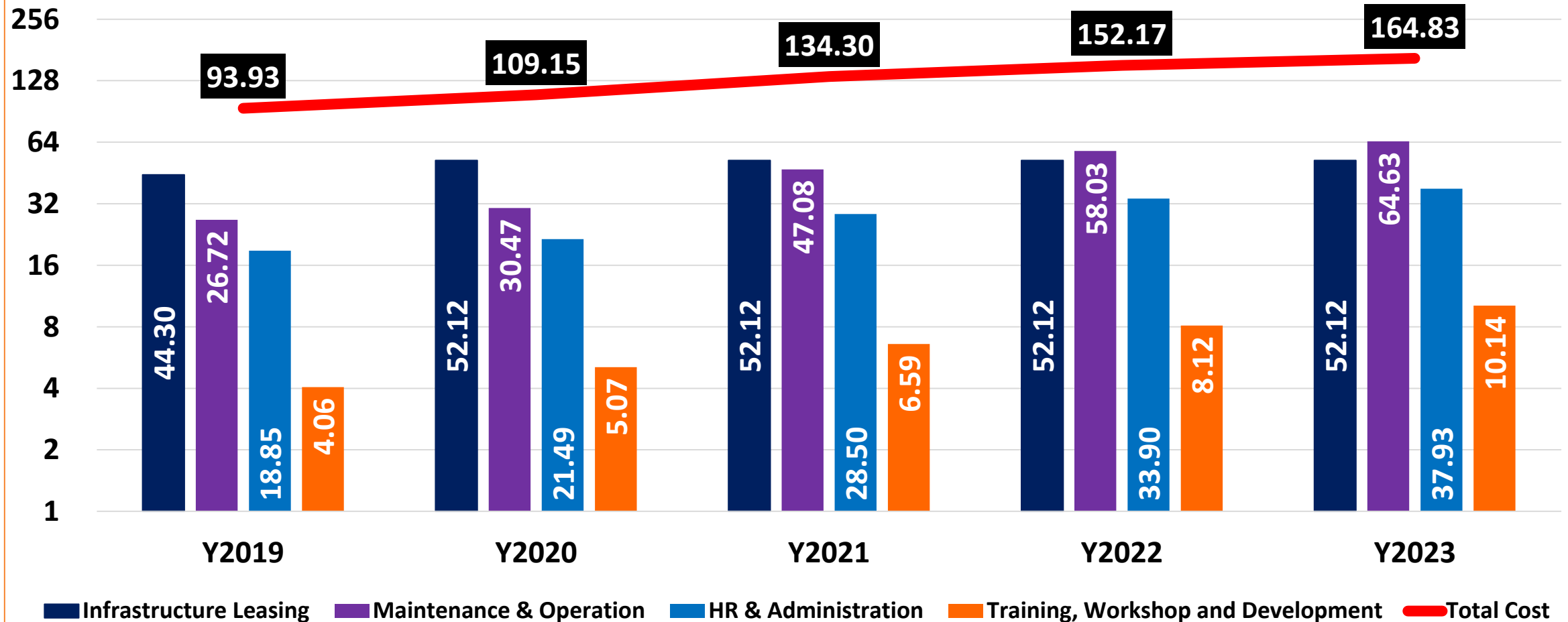


OpEx Distribution for Basic Services

Assumptions:

- (a) Subscription-Based Charging Model for Packages (A, B, C) – 34~40 Public Universities
- (b) Utilization-Based Charging Model – 41~190 Private Universities and other Institutions

OpEx Distribution (MBDT) : Y2019-Y2023

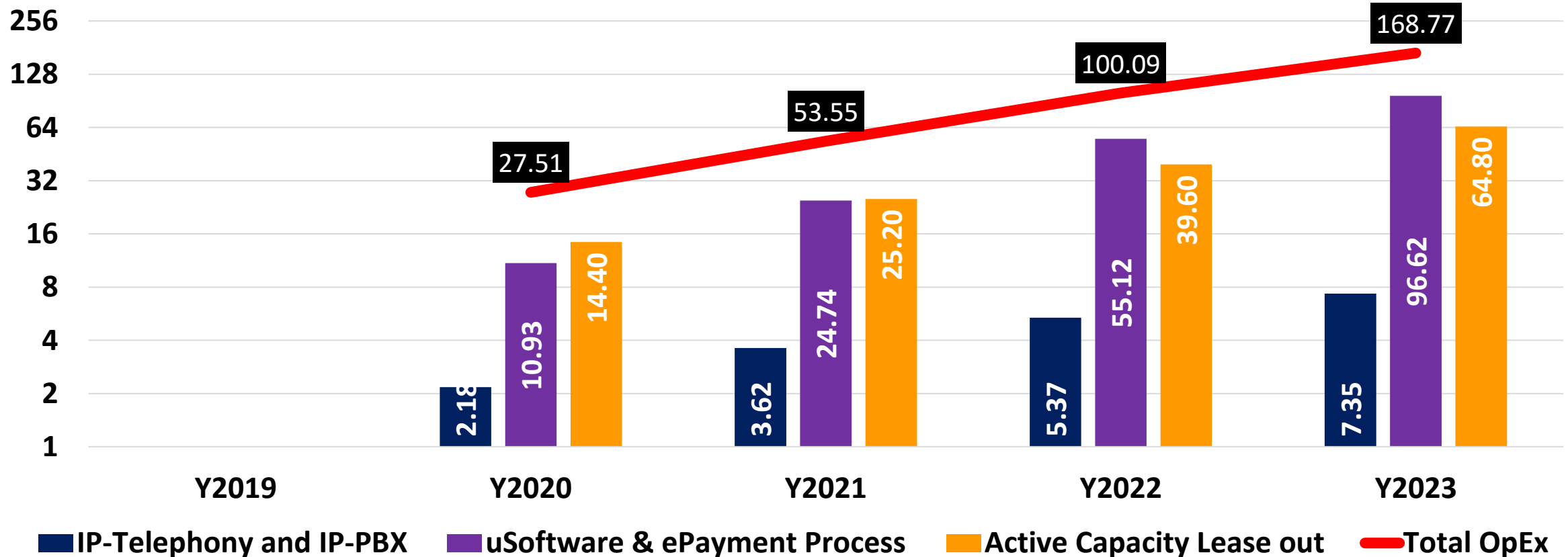


OpEx : Application & Infrastructure Services

Assumptions:

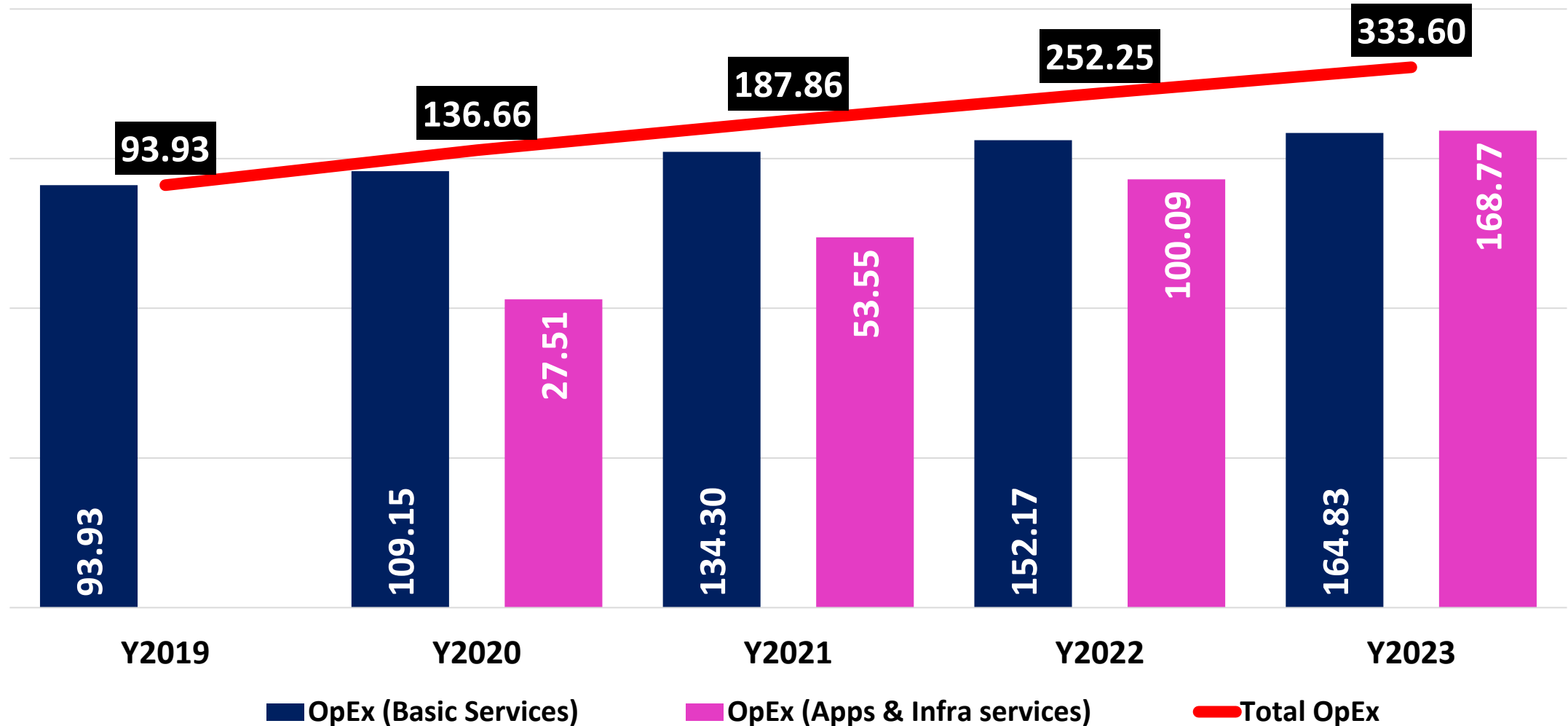
- (a) IP-Telephony & IP-PABX -- Partnering with IPTSP (Less CapEx)
- (b) uSoftware & ePayment Process -- Revenue sharing with member institutions
- (C) Active Capacity Lease out -- Partnering with PGCB under revenue sharing model

OpEx (MBDT) - Application & Infrastructure Services



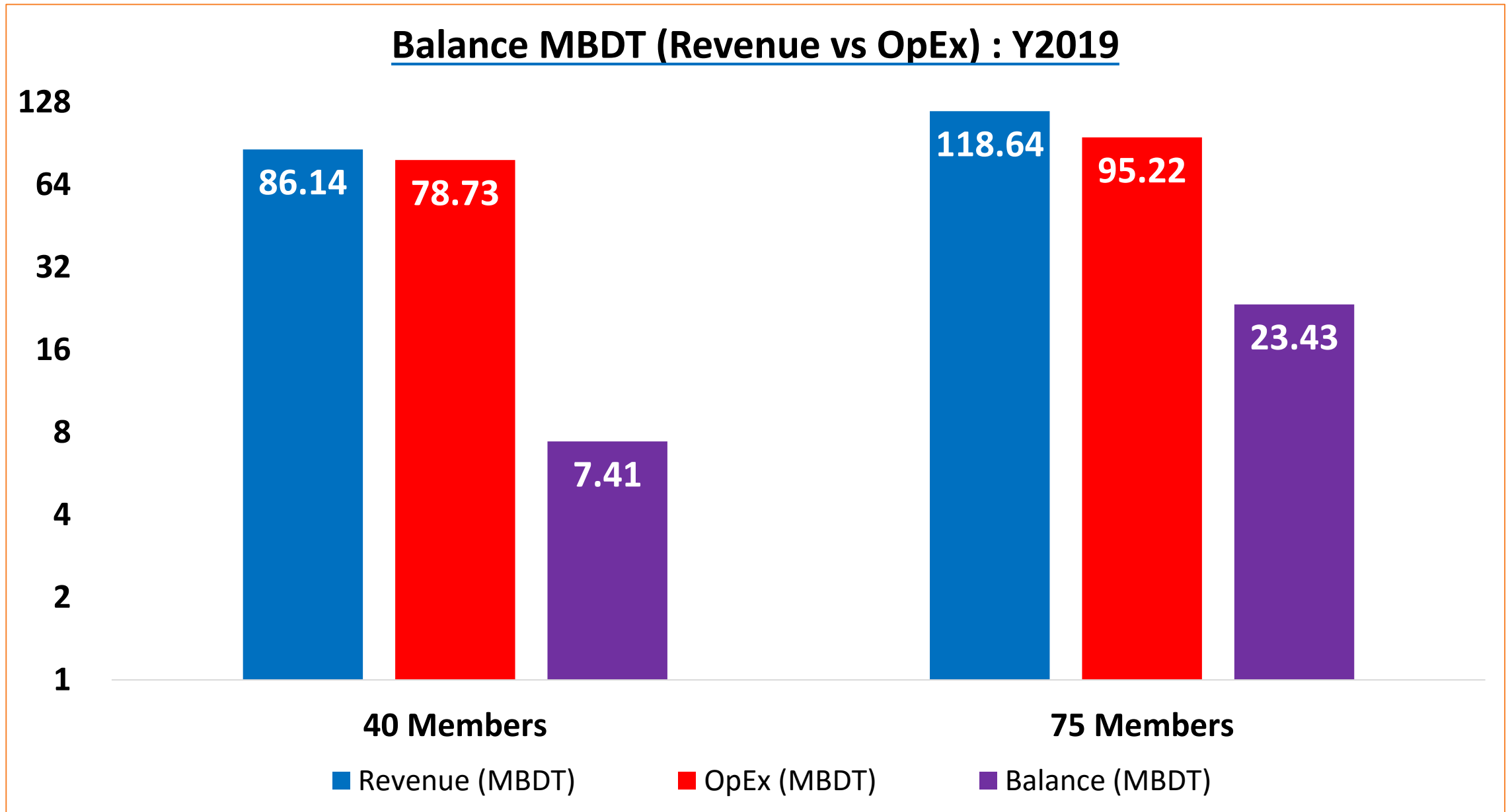
OpEx (Basic + Application & Infrastructure Services)

OpEx (MBDT)



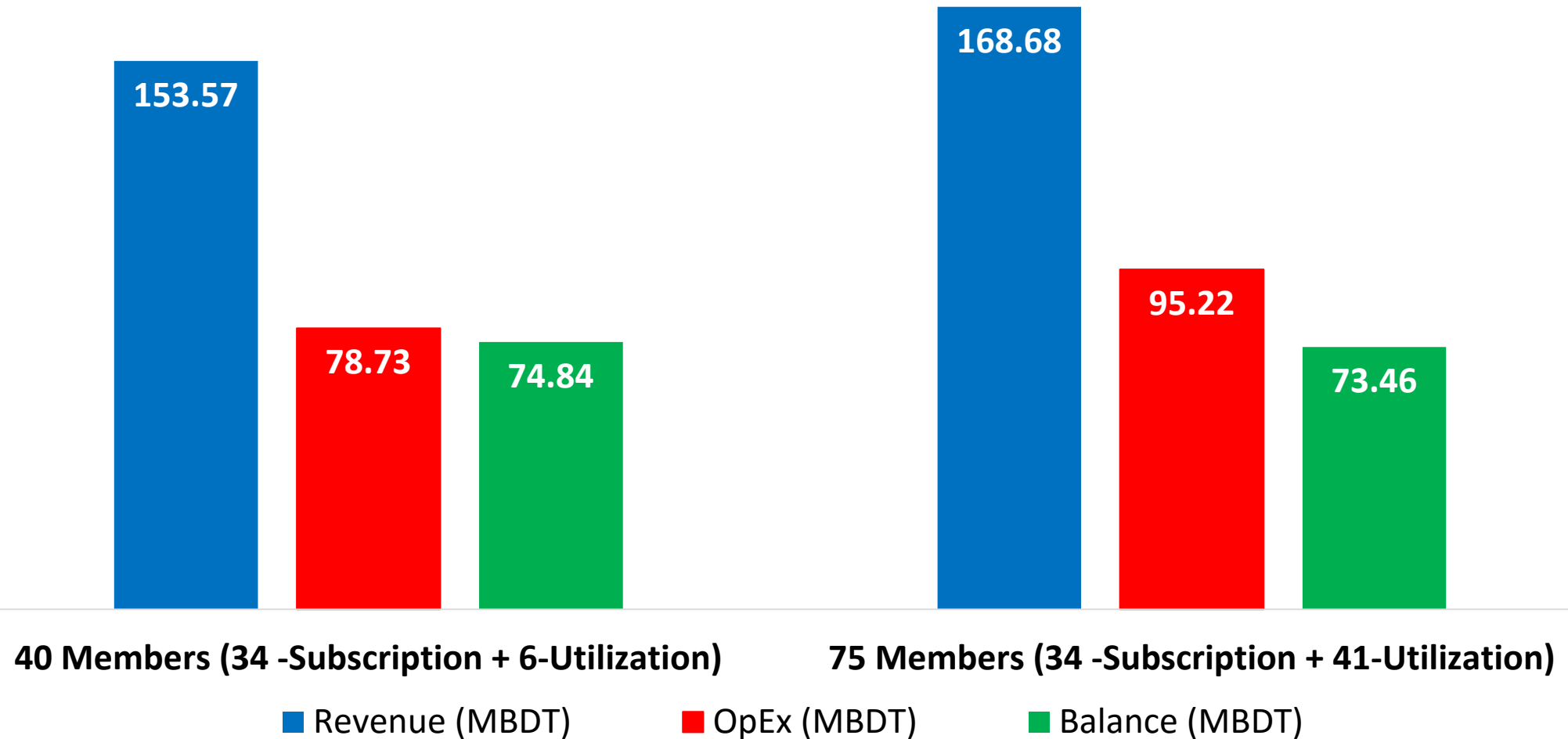
GAP Analysis for Financial Sustainability

Balance : Utilization Based Charging Model (Current Practice)



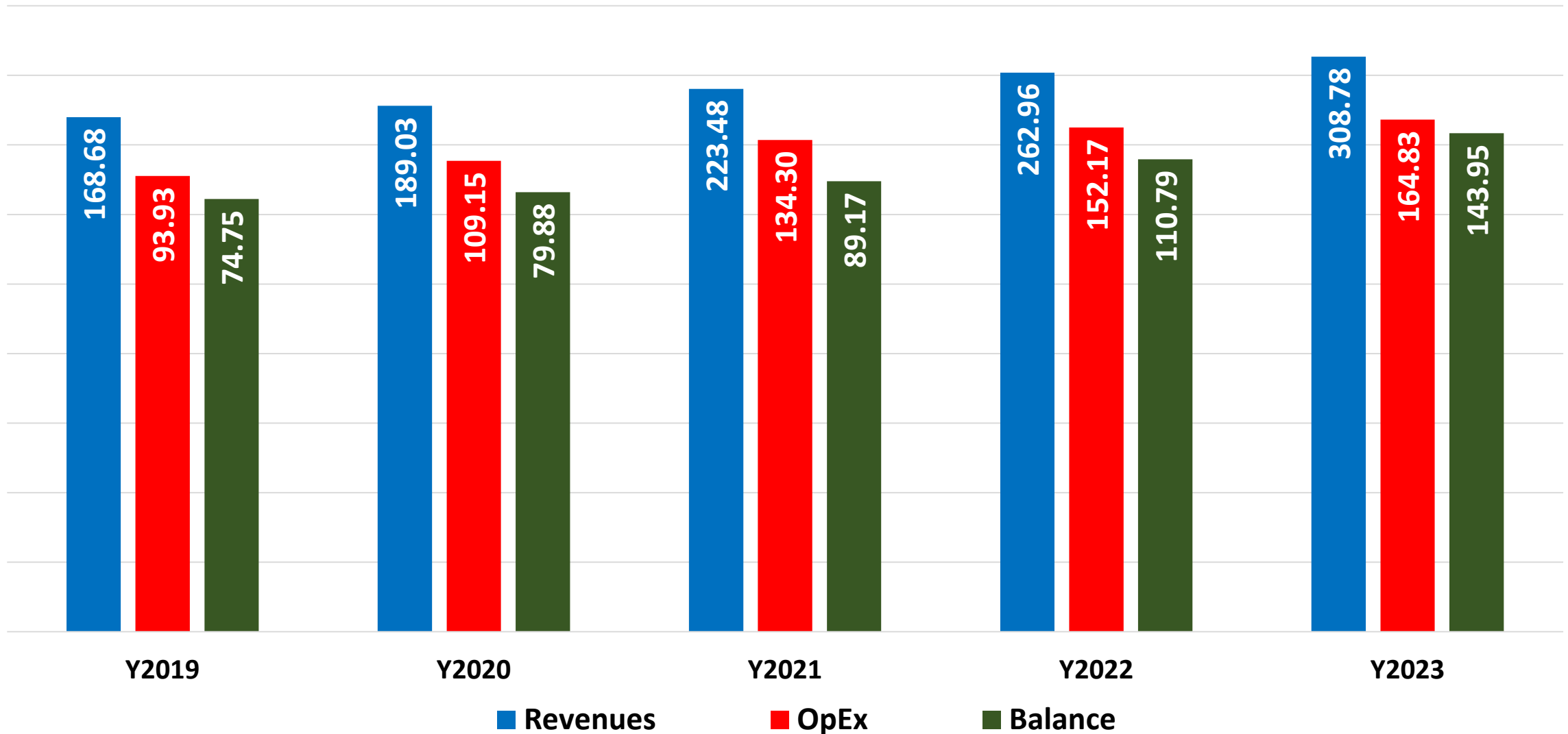
Balance (Subscription and Utilization Based Charging Model)

Balance MBDT (Revenue vs OpEx) : Y2019



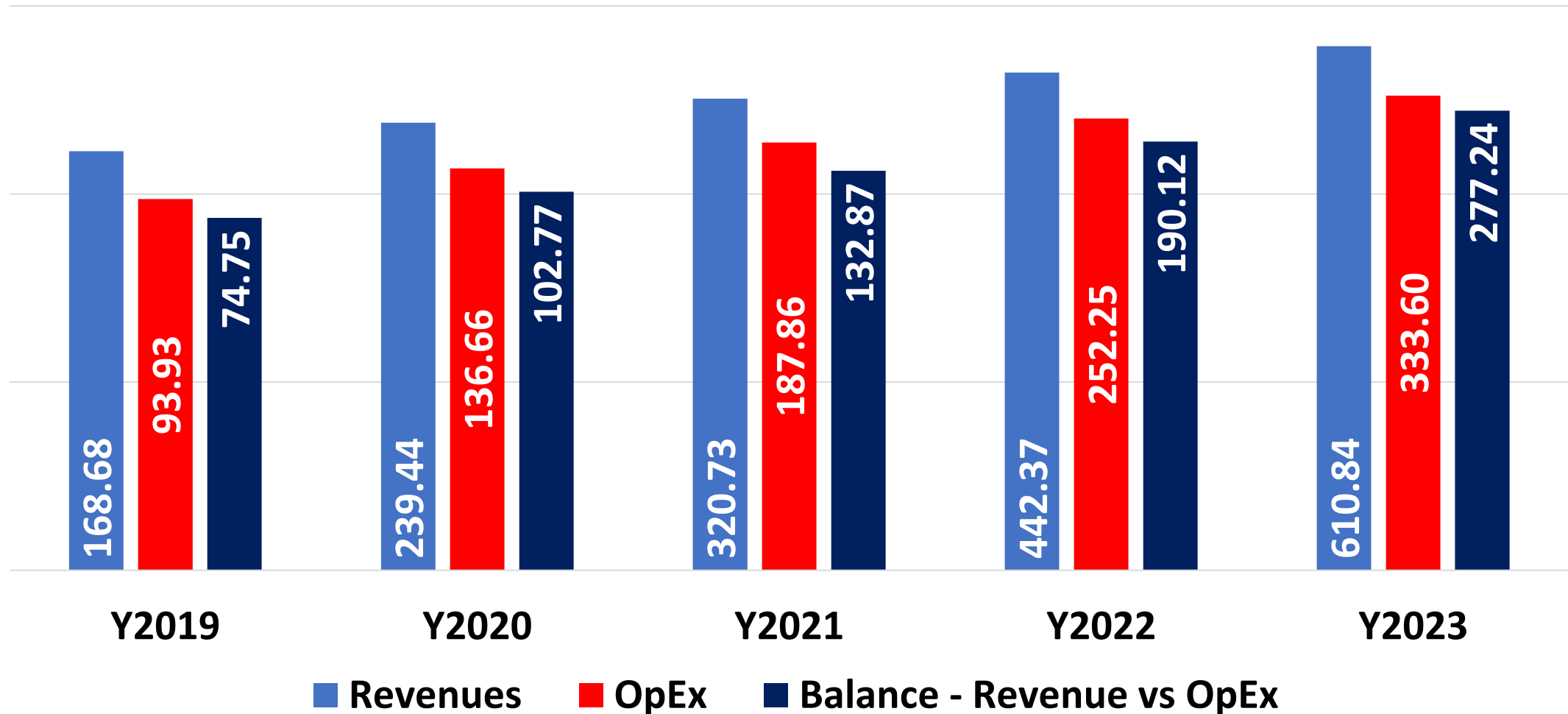
Balance from Basic Services (Subscription & Utilization Based)

Balance MBDT (Revenue vs OpEx) : Y2019~Y2023



Balance - (Basic + Application & Infrastructure Services)

Balance - Revenue vs OpEx (MBDT)



Recommendations

Policy Setting for Key Recommendations

1. Membership fee needs to be reviewed and fixed (Decided).
2. Policy for endowment fund management to be framed (Determining a best Plan) (Decided).
3. Subscription Based “Monthly Service Charge” for Public Universities (Decided).
4. Network Modernization Cost to be provided by Government Funds (Open).
5. UDL Payment mode for BdREN Service Subscription for Public Universities (Decided).

Recommendations for BdREN Trust

1. Involve BdREN as the Resource Organization in the projects undertaken by MoE.
2. Explore Direct or Indirect financial benefits to sustain BdREN Trust
3. Involving BdREN Trust in the next phase (HEQEP2) as the Single Source Consulting Organization for Designing and implementation monitoring of all ICT related activities and also in future projects under MoE.
4. Unified Education Resource Management Services in HEIs for SMART Learning Systems.
5. Income generation strategy by adding adequate, attractive & productive value added Applications on top basic services.
6. eCommerce payment integration systems to collect student's fees.

Questions please...



Thank You