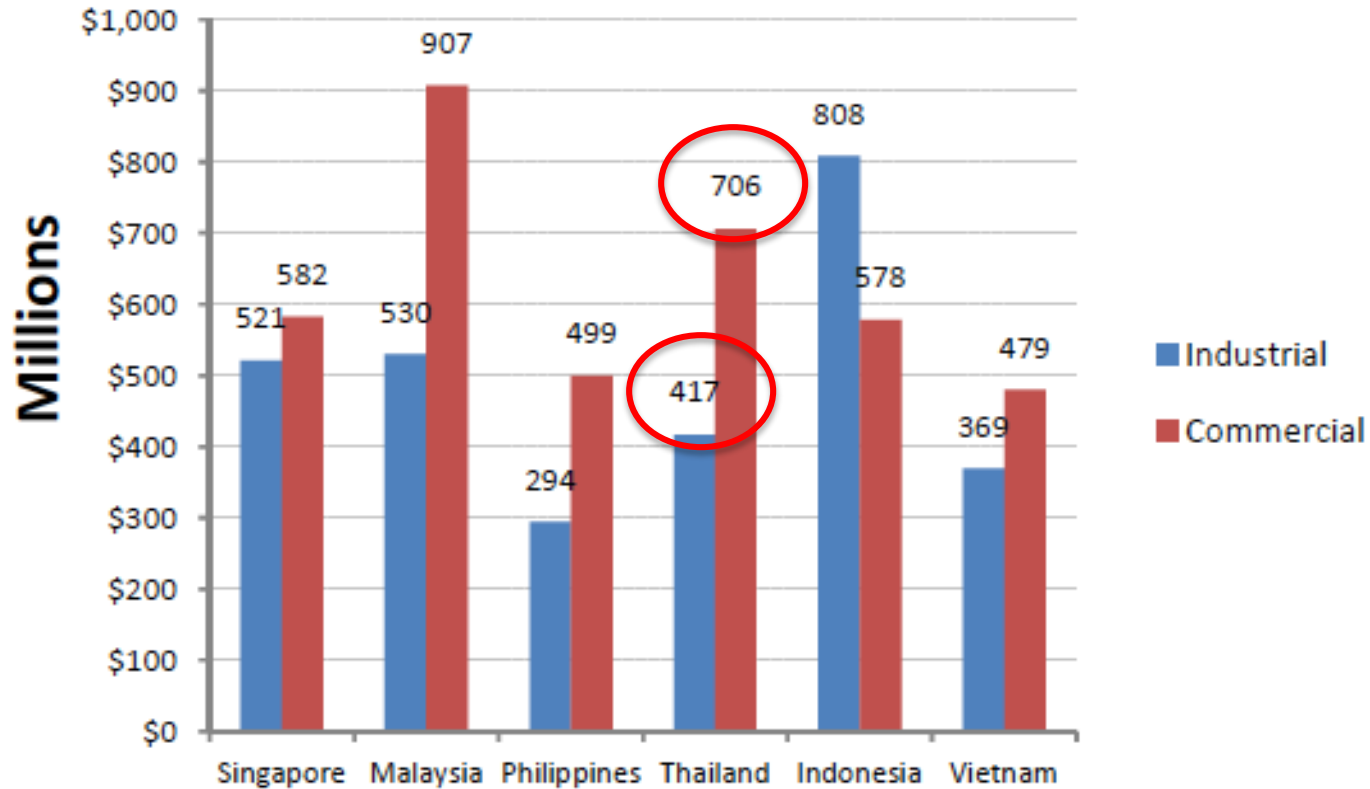


Market Potential of EE and ESCO Projects in Thailand

18 November 2015

Christopher Seeley

ESCO Market Potential (US\$ million)



Thailand Potential EE Market =US\$1,123 mil (40.2 billion THB)

(ReEx Capital, 2011)

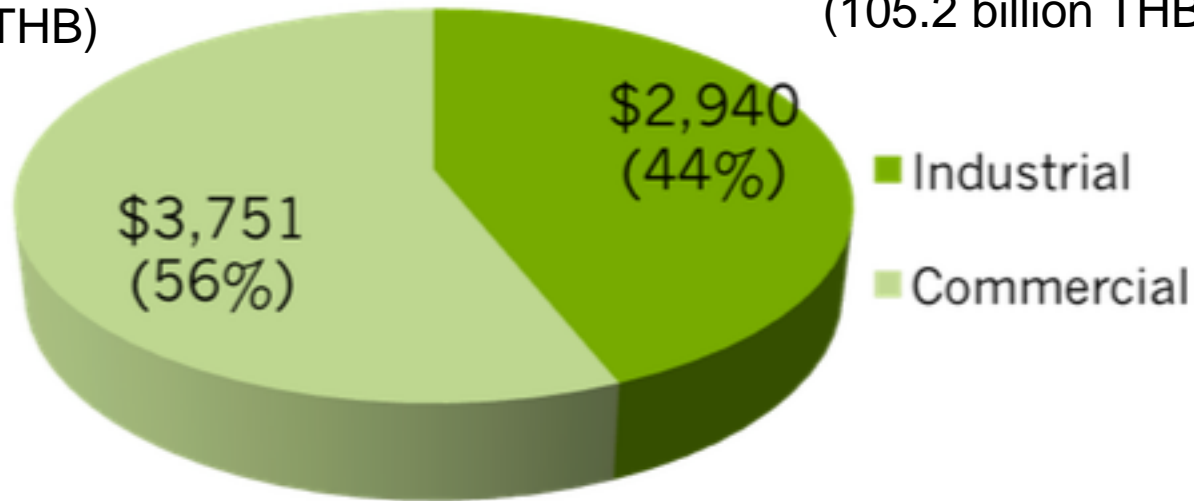
Energy Efficiency Market Potential in SEA (US\$ mil)



Investment Potential

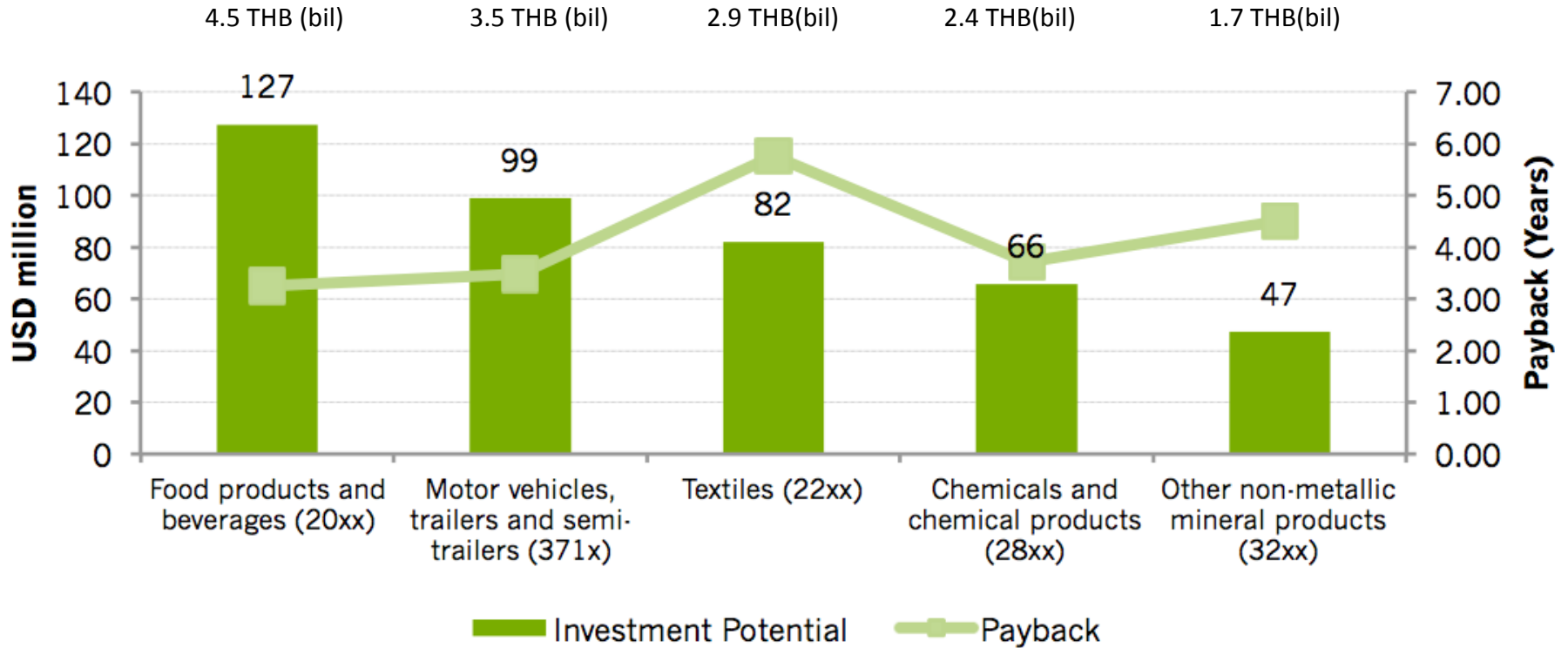
(127.8 billion THB)

(105.2 billion THB)



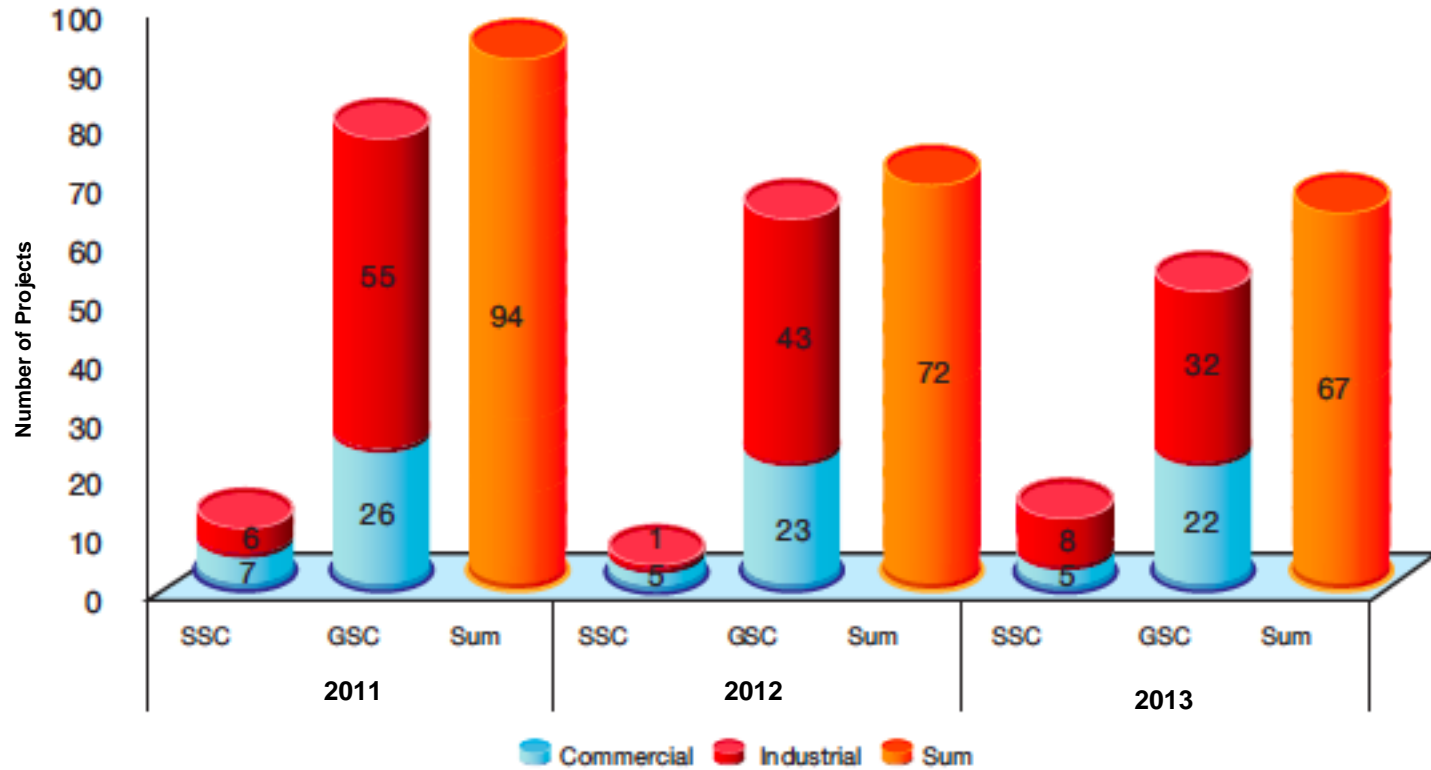
(ReEx Capital, 2011)

Top 5 Industries by Investment Potential - Thailand



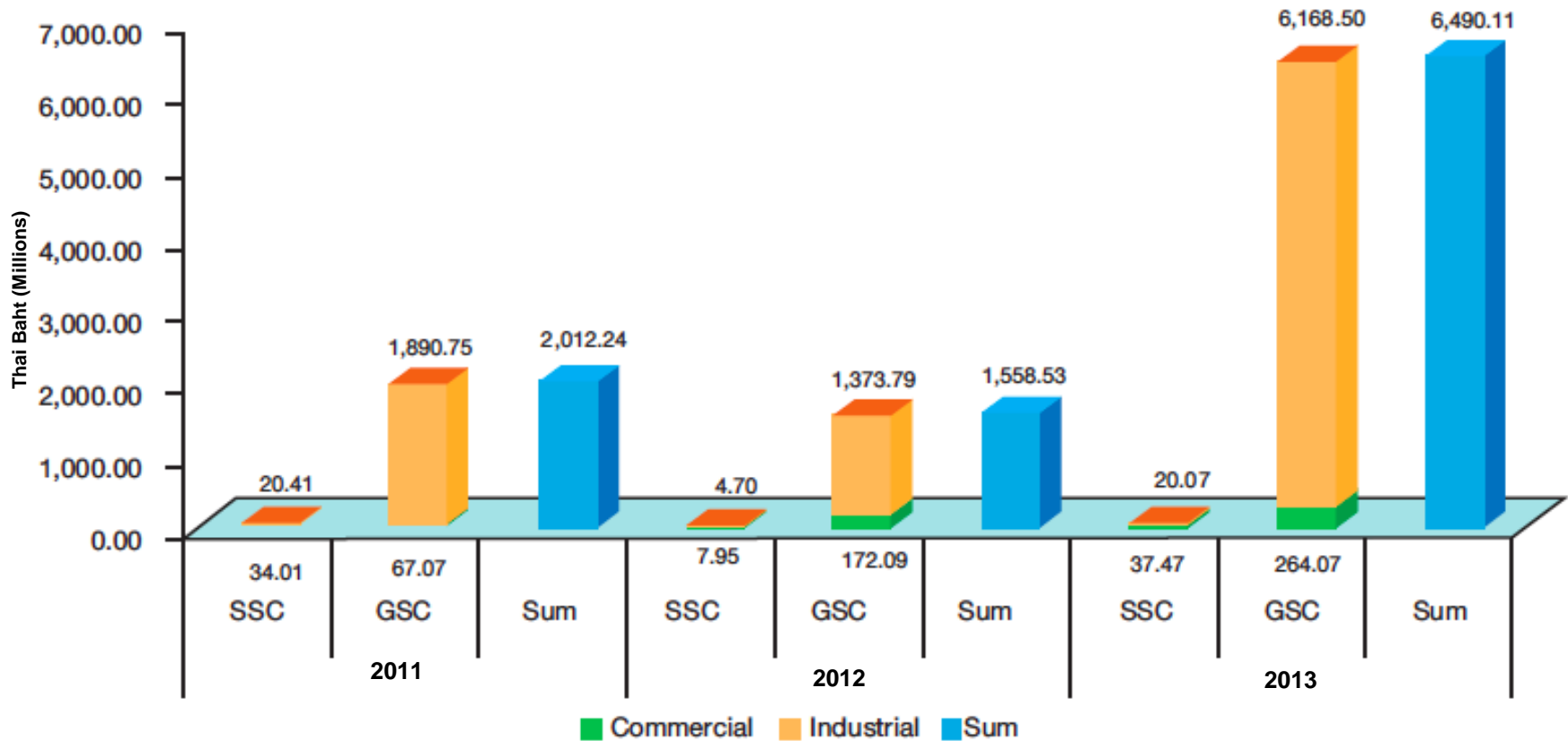
(ReEx Capital, 2011)

ESCO Projects in Thailand, 2011-2013



Federation of Thai Industries, 2014

ESCO Projects Investments, 2011-2013 (THB million)



(Federation of Thai Industries, 2014)

ESCO Potential Markets – Building Sectors

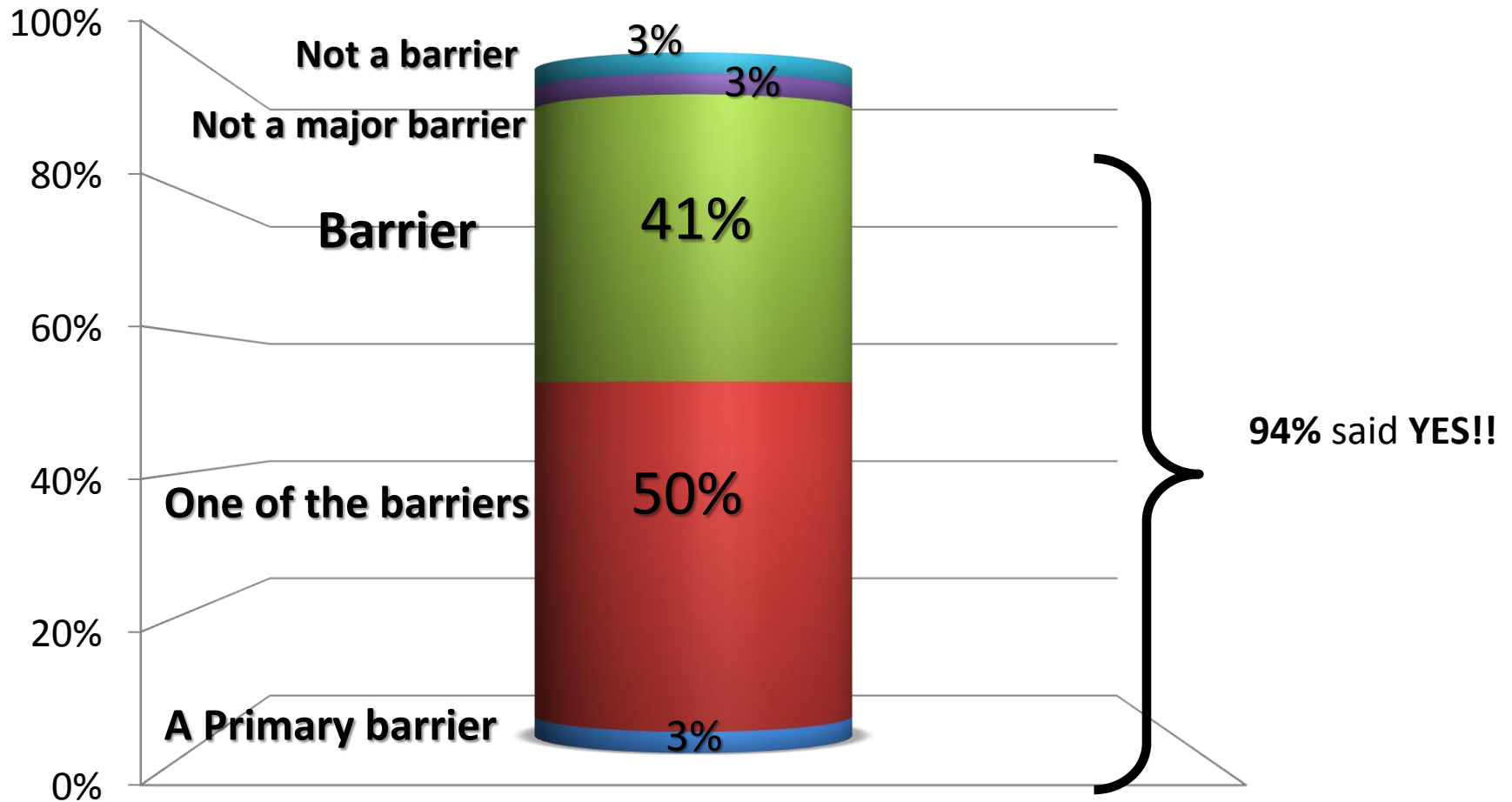
Building Type	Low	Medium	High	Description
Commercial Office		✓		<ul style="list-style-type: none"> Office buildings represent the largest total amount of electricity among commercial buildings in Thailand (43.53%) Energy intensity is lower than hotels and retail, Payback periods for energy efficiency investments longer (average 4-5 yrs)
Hotel & Retail			✓	<ul style="list-style-type: none"> Hotels and retail buildings represent the highest energy intensity (kWh/m²/yr) among commercial buildings. They often operate long hours (hotels 24 hours) Are often large facilities (>10,000m²) requiring large cooling capacity Payback periods average 3-4 yrs
Industrial – Food + Beverage			✓	<ul style="list-style-type: none"> Very large sector w many international and regional manufacturers High energy intensity Heating and cooling represent large % of energy consumption (very centralized consuming equipment) 'Manageable' complexity in process and equipment for ESCOs (external expertise) Payback periods average 2 yrs
Industrial - Textiles		✓		<ul style="list-style-type: none"> Very large sector but multiple small manufacturers Energy consumption very specific to production process 'Motor' efficiency opportunity for ESCOs Energy efficiency improvements require very specific know-how eg dyeing, spinning, fiber production Payback periods average 2-3 yrs
Industrial - Automotive		✓		<ul style="list-style-type: none"> Very large sector w many international and regional manufacturers High energy intensity HVAC and 'Motor' efficiency opportunity for ESCOs Highest consuming areas in production line require very specific know-how Usually large internal expertise Continuous operations make implementation difficult Payback periods average 2-3 yrs
Residential	✓			<ul style="list-style-type: none"> Very low average energy intensity (kWh/m²/yr) Multiple individual 'customers' – not suitable for ESCOs Decentralized systems Potential market in 'Services Apartments' (similar characteristics to hotels)
Public Buildings	✓			<ul style="list-style-type: none"> Very low average energy intensity (kWh/m²/yr) Short operate hours compared to commercial and industrial facilities mean long payback periods (5-7 yrs) Existing government 'energy savings' campaigns and internal practices [technology replacement programs (eg T5 lamps, high efficiency AC), behavioral change, energy managers, etc] No existing legislation for ESCO-type contracts

ESCOs, Projects, & Investment Potential (8-Years)



ESCOs	BASE			FUTURE		
	Year 1			Year 8		
	2016			2023		
	ESCOs	Projects	US\$ (million) THB (million)	ESCOs	Projects	US\$ million) THB (million)
Existing Small ESCOs (New Small ESCOs)						
Existing Medium ESCOs (New Medium ESCOs)	35	140	59 (2,150)	54	628	265 (9,500)
Existing Large ESCOs (New Large ESCOs)						

Is Finance a Barrier to Energy Efficiency?



Conclusion



- Great support for ESCO market from Government
- Strong ESCO expertise and experience in Thailand
- Very large potential for the ESCO market in Thailand and across SEA
- But there are many barriers and challenges:
 - Financing (accessible and affordable financing)
 - Market development activities
 - Lack of Capacity (all stakeholders)
 - Lack of confidence in ESCOs
 - Lack of M&V standards
 - Lack of ESCO certification (industry standards)
 - Lack of information