

Overview pillar C Use Cases (Feasibility Studies)

	Use Case 1	Use Case 2	Use Case 3	Use Case 4
Grid	<ul style="list-style-type: none"> ▪ Metro grid ▪ Connection point: substations 	<ul style="list-style-type: none"> ▪ Metro grid ▪ Connection points: metro stations and substations 	<ul style="list-style-type: none"> ▪ Tram grid 	<ul style="list-style-type: none"> ▪ Trolleybus grid
Charged veh.	<ul style="list-style-type: none"> ▪ Taxis, private hire vehicles, TFL fleet vehicles, freight vehicles 	<ul style="list-style-type: none"> ▪ e-cars and e-bikes at off-street and on-street parking places 	<ul style="list-style-type: none"> ▪ Fleet cars and third-party e-cars 	<ul style="list-style-type: none"> ▪ Hybrid trolleybuses, e-bikes and e-cars
Scope	<ul style="list-style-type: none"> ▪ Comprehensive study (e.g. technical, operational, legal topics) 	<ul style="list-style-type: none"> ▪ Comprehensive study (e.g. technical, operational, financial, legal topics) 	<ul style="list-style-type: none"> ▪ only legal barriers and juridical backgrounds 	<ul style="list-style-type: none"> ▪ Comprehensive study (e.g. technical, operational, legal topics)

Pillar C – Cross Use Case Comparison

	Use Case 1	Use Case 2	Use Case 3	Use Case 4
Technology Readiness	<p>[S]</p> <ul style="list-style-type: none"> ▪ Market availability <ul style="list-style-type: none"> – Charging technology (charger and supercharger): fully available – Monitoring, control and user management systems: available ▪ Standardization (hardware, software, interfaces): available 	<p>[S]</p> <ul style="list-style-type: none"> ▪ Market availability <ul style="list-style-type: none"> – Charging technology (charger and supercharger): fully available – Monitoring, control and user management systems: available for pilot projects – Grid management technology: fully available ▪ Standardization (hardware, software, interfaces): available 	<p>[S/W]</p> <ul style="list-style-type: none"> ▪ Market availability <ul style="list-style-type: none"> – Charging technology (charger and supercharger): just available for pilot projects (barrier: price and manufacturing capacity of suppliers) ▪ Standardization (hardware, software, interfaces): available 	<p>[S/W]</p> <ul style="list-style-type: none"> ▪ Market availability <ul style="list-style-type: none"> – Charging technology (charger and supercharger): fully available – Grid management technology: R&D stage (critical points: voltage, current transformation, communication systems) ▪ Standardization (hardware, software, interfaces): available

Pillar C – Cross Use Case Comparison

	Use Case 1	Use Case 2	Use Case 3	Use Case 4
Effect on Grid	<p>[S]</p> <ul style="list-style-type: none"> There are no perceived negative effects on the existing public transport grid it does not affect the reliability or availability of the current PT system 	<p>[S]</p> <ul style="list-style-type: none"> There are no perceived negative effects on the existing public transport grid it does not affect the reliability or availability of the current PT system 	<ul style="list-style-type: none"> No statement 	<p>[S]</p> <ul style="list-style-type: none"> There are no perceived negative effects on the existing public transport grid it does not affect the reliability or availability of the current PT system
Planning and Implementation	<p>[S/W]</p> <ul style="list-style-type: none"> Planning and implementation effort for using metro substation: same compared to similar projects Replicating the project outside of TfL property also faces many complications 	<p>[S/W]</p> <ul style="list-style-type: none"> Planning and implementation effort for using metro substation: lower compared to similar projects Problems at the decision making level, legal, administrative, financial barriers Specific needs: double connection 	<p>[W]</p> <ul style="list-style-type: none"> Planning and implementation effort for the using tram system: higher compared to similar projects problems are both technical and operational 	<ul style="list-style-type: none"> No statement

Pillar C – Cross Use Case Comparison

	Use Case 1	Use Case 2	Use Case 3	Use Case 4
Integration of systems	<p>[W]</p> <ul style="list-style-type: none"> ▪ Charging of e-vehicles is second priority, may cause power quality issues and power availability issues to the grid (cannot be tolerated since it should have no impact on the operations of the LU rail system) <p>[O]</p> <ul style="list-style-type: none"> ▪ Effects can be mitigated with demand control, electrical separation, power storage and detailed real time monitoring 	<p>[W]</p> <ul style="list-style-type: none"> ▪ Load management is difficult in operation and the coordination between organizations further adds to the challenges in terms of operational integration of this technology 	<ul style="list-style-type: none"> ▪ No statement 	<p>[W]</p> <ul style="list-style-type: none"> ▪ existing infrastructure is not able to power the charging station and require big investments in infrastructure

Pillar C – Cross Use Case Comparison

	Use Case 1	Use Case 2	Use Case 3	Use Case 4
Investment Criteria	<p>[S/W]</p> <ul style="list-style-type: none"> Investment criteria mainly fulfilled: <ul style="list-style-type: none"> –technical performance –product lead time –costs 	<p>[S/W]</p> <ul style="list-style-type: none"> Investment criteria mainly fulfilled: <ul style="list-style-type: none"> –meeting demand, easiness of implementation, resilience –energy providers positioning improvement –pollution reduction 	<p>[W]</p> <ul style="list-style-type: none"> Investment criteria not fulfilled: <ul style="list-style-type: none"> –costs –subsidies –energy consumption –noise and emissions 	<p>[S/W]</p> <ul style="list-style-type: none"> Investment criteria mainly fulfilled: <ul style="list-style-type: none"> –project budget limit –maintenance costs –operating costs
Legal Framework	<p>[O]</p> <ul style="list-style-type: none"> Energy & Grid, Safety: <i>neutral</i> Environment: <i>neutral</i>, but many policies and measures are favorable (i.e. London Ultra Low Emission Zone) 	<p>[T]</p> <ul style="list-style-type: none"> Energy & Grid: unfavorable Safety: unfavorable Environment: neutral 	<ul style="list-style-type: none"> no statement 	<p>[T]</p> <ul style="list-style-type: none"> Energy & Grid: unfavorable (not allowed to sell electricity at public e-chargers) Safety: neutral Environment: neutral (concept in general aligned with policy goals)

Pillar C – Cross Use Case Comparison

	Use Case 1	Use Case 2	Use Case 3	Use Case 4
City Benefits	<ul style="list-style-type: none"> No statement 	<p>[O]</p> <ul style="list-style-type: none"> project will increase social cost-benefit and urban resilience, and have high economic and social return since it synergizes two already existing systems 	<ul style="list-style-type: none"> No statement 	<p>[O]</p> <ul style="list-style-type: none"> project contributes positively to the PT-operator's public image as a sustainable company. project will help the acceptance of e-mobility in the general population