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The KIIRA EV Project is championing research and innovation in the area of technological advancement of automotive manufacturing in Uganda under the brand name of KIIRA Motors Corporation (KMC). After the launch of the KIIRA EV Proof of Concept Car, on November 24, 2011 by H.E. the President of the Republic of Uganda Yoweri Kaguta Museveni, the KIIRA EV Project embarked on defining a flagship production vehicle - the KIIRA EV SMACK. Designed as a 5-seater sedan, the KIIRA EV SMACK is a front-wheel drive vehicle with a traction motor powered by a rechargeable battery bank and an internal combustion engine-based generator. This configuration of two power sources ensures an unlimited range and increases the efficiency of the powertrain, hence enhancing fuel economy. This innovative and iterative development programme is envisaged to scale KMC’s flagship production vehicle, the associated infrastructure, systems and requisite competencies for the relevant and beneficial institutionalization of an automotive industry in Uganda. The vision of KMC represents the commitment of Uganda to develop indigenous solutions to her essential needs as well as being a fountain of the heritage of the Pearl of Africa KMC shall foster Uganda’s global competitiveness for wealth creation and national prosperity through the innovation-led approach to economic transformation.
The KIIRA EV is a Two-Seater Car with a Maximum Speed of 100KPH, a Range of 80Km, Dry Weight of 1000kg, Powered by a 26HP AC Induction Motor, with Zero Tail Pipe Emissions and Insignificant Powertrain Noise.

The KIIRA EV SMACK is designed to utilise a series hybrid powertrain architecture enabling the vehicle to deliver a range bound to the availability of fuel in the tank, along with an all electric range of 32km for urban duty cycle at zero emission.
The first tactical goal of the KIRA EV Project was to design and build a 2-seater Electric Vehicle as a proof of concept to demonstrate that it has the talent, discipline, and leadership to contribute meaningfully towards the development of high-tech transportation solutions. The KIRA EV was launched on Friday 24th November 2011 by HE Yoweri Kaguta Museveni the President of the Republic of Uganda.
The aquatic theme of the KIIRA EV SMACK is inspired by the River Nile, a body whose native name is KIIRA. Just like a river that starts widely from its source and narrows as it approaches the waterfall so does the KIIRA EV SMACK derive its exterior persona. The bold character lines give the car a stance that cannot go unnoticed, as the belt line accelerates from the front moving upwards and then gradually glides downward just like a wave. The signature grill at the front of the car gives it a sophisticated look – a solid identity of poise and elegance. The front end of the KIIRA EV SMACK is a synthesis of natural shapes and lines that fused seamlessly to advance into a flagship like no other. The craftsmanship and detail are well expressed in the creases and surface patterns that surround the sculpted tail end which accentuates the fluid nature of the lights. The goal was to create a design that is both appealing and practical. The enthusiasm and passion of students from SAINT MARY'S COLLEGE KISUBI (SMACK), who won a Science, Technology and Innovation Challenge inspired the design team and ignited stimulating ideologies and strategies. Since people are fascinated with the electrifying aura of elegant sports cars, the design team embarked on this exhilarating journey to create the KIIRA EV SMACK with homogenous features.

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PEOPLE ARE FASCINATED WITH THE ELECTRIFYING AURA OF ELEGANT SPORTS CARS
The collaboration between the engineering and design team led to a sleek concept of the lighting that fully reflects the elegance of the KIRA EV SMACK. The almond-shaped tail light was developed to provide the driver with a clear and bright visual. The light extends into the sides of the car increasing the scope of visibility.
### Powertrain Performance (Electric Mode)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum Speed</strong></td>
<td>85KPH</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>32km</td>
</tr>
<tr>
<td><strong>Maximum Torque</strong></td>
<td>170Nm (up to 3000 RPM)</td>
</tr>
<tr>
<td><strong>Peak Power (Battery Pack)</strong></td>
<td>26kW</td>
</tr>
<tr>
<td><strong>Acceleration Performance</strong></td>
<td>1.60m/s²</td>
</tr>
<tr>
<td><strong>0 to 60KPH in 10.5s</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Gradeability</strong></td>
<td>21% (12°) at 30KPH</td>
</tr>
</tbody>
</table>
Powertrain Performance (Hybrid Model)

- **Maximum Speed**: 140KPH
- **Range (full tank)**: 500km
- **Maximum torque**: 170Nm
- **Peak Power**: 107Hp/80kW
- **Acceleration Performance**: 1.60 m/s²
  0 to 60KPH in 10.5s
- **Gradeability**: 21% (12°) at 30KPH
- **Fuel Consumption (City)**: 25mpg/10KPL
- **Fuel Consumption (Highway)**: 28mpg/12KPL
A core value that KIIRA EV Project lives and breathes every single day is the commitment to deliver top-notch technology that every customer of the KIIRA EV SMACK will fall in love with and appreciate. The Car Technology Team was uncompromising in benchmarking and identifying smart and user-friendly tools that enhance the experience of someone driving the KIIRA EV SMACK with remarkable features such as Push to Start System, Smart Keyless Access Control System that automatically opens the doors of the car as you approach it at a range of 2-3 meters, CANvu with visibly clear displays, Parking Assist with Rear View Camera that is automatically enabled when the driver is in reverse and an advanced Multimedia System that enables you to make hands-free calls and is greatly compatible with a wide variety of smart phones. These technologies provide the customer with comfort, convenience and a wealth of information about the state of the car right at their fingertips. It goes without mention that the KIIRA EV SMACK also has Power Seats, Windows and Mirrors as well as Air Conditioning.
When parking, the Rainbow LED Display uses colour to inform the driver of the car’s proximity to a nearby object. The car is also installed with Bi Bi voice warning as well Parking Radar Sensors mounted at the rear to detect distance between the car and an obstacle at a range of 0 – 2.5 meters.

Push to Start System and Smart Keyless Access Control System

The Push to Start system allows the driver to start the car by simply pressing the start button. No need to worry about locking the car because the Smart Keyless Control System automatically locks the car after you have left the range from which the key fob is sensed. Lock and unlock with the key fob in your pocket.

Parking Assist and Rear view Camera

When parking, the Rainbow LED Display uses colour to inform the driver of the car’s proximity to a nearby object. The car is also installed with Bi Bi voice warning as well Parking Radar Sensors mounted at the rear to detect distance between the car and an obstacle at a range of 0 – 2.5 meters.
The KIRA EV SMACK acknowledges your presence as you approach it by automatically unlocking the doors with the key fob in your pocket.

Car Technology

Multimedia System

The Sirius Multimedia System platform has a smart phone connectivity via wireless Bluetooth feature. You can enjoy the songs you love from a smart device or straight from the car radio, enable video and audio options for USB, DVD and CD. The display is effortlessly touchscreen and has remote control options.

CANvu Display

The display shows vehicle status initializing or ready, battery state of charge, battery voltage, motor speed and motor power.
The alluring effect of the car’s outlook leads you directly to the interior which doesn’t disappoint one bit. The KIBA EV SMACK comfortably seats four adults with enough space and legroom for everyone to enjoy the fun ride. The inspiration behind the interior trim and packaging was led by focusing on comfort and a tranquil getaway from the surrounding environment. The intense slope on the dashboard gives you an extremely large pocket of space and this is not only seen but felt. The central console that holds the infotainment system has a fresh and modern look lending to the aquatic theme that carried on throughout the car’s development. Instrument panel features are distinctive to give quick and accurate feedback. Elegance is captured in the selection of quality leather seat surfaces and a touch of marble on the door inlays. The craftsmanship and skill used to execute the seat surfaces and dashboard dressing was meticulous with just the right lines and contours to deliver comfort and beauty all in one. Simplicity at its finest is defined in the selection of the steering wheel and stick shift.

"THE INTERIOR GIVES YOU AN EXTREMELY LARGE POCKET OF SPACE AND THIS IS NOT ONLY SEEN BUT FELT"
We will go all out to create the ultimate signature customer experience by infusing your unique personality in the KIRA EV SMACK to deliver individuality at its best.

Options

- #Pearl Black
- #Blue
- #Pearl White
- #Red
- #Grey
**Options**

### Cars

<table>
<thead>
<tr>
<th>Brand</th>
<th>TSW</th>
<th>TSW</th>
<th>TSW</th>
<th>TSW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electric Range</strong></td>
<td>32km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hybrid Range</strong></td>
<td>500km</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Wheels

<table>
<thead>
<tr>
<th>Brand</th>
<th>TSW</th>
<th>TSW</th>
<th>TSW</th>
<th>TSW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brand</strong></td>
<td>TSW</td>
<td>TSW</td>
<td>TSW</td>
<td>TSW</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td>Mesh wheel (20/10 config)</td>
<td>Mesh wheel (20/10 config)</td>
<td>10 spoke wheel</td>
<td>5 spoke wheel</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>Amaroo Multi-Piece MATTE BLACK</td>
<td>Amaroo Silver w/ Brushed Face &amp; Chrome Stainless Lip</td>
<td>Brooklands Silver w/ mirror cut Face</td>
<td>Cadwell Gunmetal W/ Mirror cut face</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>R1 8-8</td>
<td>R1 8-8</td>
<td>R1 7-8</td>
<td>R1 7-8</td>
</tr>
<tr>
<td><strong>Bolt pattern &amp; size</strong></td>
<td>5-100</td>
<td>5-100</td>
<td>5-100</td>
<td>5-100</td>
</tr>
</tbody>
</table>
The first ever Automotive Original Equipment Manufacturer in Uganda and in the greater East African Region – the KIIRA EV Motors Corporation (KMC) complex shall sit on 100 acres of land situated at the Jinja Industrial and Business Park on Plot 113, Block 2 Kagogwa village, Mawato Parish, Kakira Town Council, Jinja district, Uganda in East Africa. This land shall be the home to world class facilities that will enable commercial production of internationally accepted and highly appreciated vehicles. The complex shall include the Production Plant (19,500 square meters), Technology & Innovation Center (19,000 square meters), Administration and Conference Center (6,000 square meters), Vehicle Testing Tracks (80,000 square meters), with Supporting Utilities and Warehouses (5,000 square meters) as well as a Guest House and Infirmary (2,540 square meters). The conceptualized production plant which is the core functional facility of the complex shall produce 840 vehicles per month with a 16 stage production line optimised to one-minute per task. A semi-automated assembly system shall also be employed for precision definite tasks. Production of the flagship KIIRA EV SMACK shall begin in the year 2018 with a blend of the conventional internal combustion engine, plugin electric vehicle and hybrid vehicle models. The Technology and Innovations Centre shall be responsible for cultivating pertinent and valuable technology in different areas including industrial design, alternative fuels as well as car electronics to make the vehicles smarter hence positioning KMC ahead of customer expectations. The Vehicle Testing Tracks shall have facilities for speed, braking, climbing, handling and durability.
The iconic structure of the Tech and Innovation Center building takes on the infinity sign to signify endless possibilities with all units stemming from it. This shall be a smart building with the façade having solar fins supplying power to auxiliary services within the building.

tests. The tracks will have a section with humps and potholes to test for noise, vibration and ride quality. The Administration block shall have modern working environments with exclusive and inclusive office space with teams distributed in accordance to specific working procedures. Sales and Marketing, Finance and Accounts, Human Resource Department as well as the Legal Department shall be housed in the same facility. A world-class Conference Hall will grace part of the ground and first floor of this equally iconic office block. The KMC product portfolio is envisaged to cover the luxury, middle, compact and small vehicle segments with SUVs, Sedans, Minibuses and Buses to provide a complete and consistent model mix differentiated by functionality, size, performance and level of comfort while maintaining a distinct common brand profile. The establishment of KMC will provide unrivalled opportunities for not only High-Tech employment but also in the areas of Business Administration, Sales, Communication, Human Resource Management, Legal and Finance. KMC prides in not only enhancing the environmental stewardship of the nation but also ensuring sustainable transportation which will facilitate economic growth.
Technical Specification

Fuel Consumption
- Highway - 28mpg, 12KPL
- City - 25mpg, 10KPL

Top Speed
- Hybrid – 140KPH
- All Electric – 80KPH

Hybrid Range
500km

Electric Range
32km (Consumption rate of 150 Wh/km)

Acceleration
1.6ms^-2 from 0 - 100KPH

Gradeability
21% (121ft at 30KPH)

Dimensions and Weights
- Length: 4900mm
- Track Width: 1660mm
- Height: 1500mm
- Wheel base: 3000mm
- Gross Weight: 2020kg
- Tire Radius: 326mm
- Maximum Ground Clearance: 168mm
- Seating Capacity: 5 Persons including driver

Performance
- Battery: 8.2kWh (4.92kWh useable), 40AH Lithium Ion, 21V Operating
- Combustion Engine: Type: GM 1.8L, Lt4, Engine Family: FAMILY 1, GEN 3
  - Engine Displacement: 1796 cc
  - Compression Ratio: 10.5:1
  - Configuration: Dual Overhead Camshaft (4 Valves per Cylinder)
  - Horsepower: 138 @ 6300 rpm
  - Torque: 170Nm @ 3800 rpm
  - Features: Variable Valve Timing
- Fuel Tank Capacity: 60 litres, Petrol
- Transmission: Single Speed BorgWarner Fixed Gear (8:1 ratio)
- Layout: Front Wheel Drive
- Traction motor: Permanent Magnet Motor, Peak Power: 107hp (80kW), Continuous Power: 50hp (37kW), Peak Torque: 170Nm, Continuous Torque: 65Nm, Top Speed: 10000 rpm
- Generator: REMHVH 250-090D, Peak Power: 140kW, Continuous Power: 100kW, Peak Torque: 320 Nm, Continuous Torque: 160 Nm, Top Speed: 10000 rpm

Suspension
- MacPherson Strut Front Suspension
- Multi Linkage Rear Suspension
- Coil Spring Front Suspension
- Semi-torsion Beam Rear Suspension
- Stabilizer Bar
- Stabilizer Bar

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- Stabilizer Bar
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### Interior Material

<table>
<thead>
<tr>
<th>Material</th>
<th>Density</th>
<th>Texture</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Temperature Fiber Blanket Thermal Insulation</td>
<td>Thickness: 1/4&quot; Thick Width: 48&quot; Wide</td>
<td>Rough</td>
<td>ASTM C392</td>
</tr>
<tr>
<td>Polyurethane Foam</td>
<td>400 kg/m³</td>
<td>Smooth</td>
<td>ASTM C1526</td>
</tr>
<tr>
<td>Polyurethane Foam</td>
<td>100 kg/m³</td>
<td>Smooth</td>
<td>ASTM C1526</td>
</tr>
<tr>
<td>Synthetic Leather</td>
<td>Thickness: 1.2mm Width: 137mm Light weight</td>
<td>Smooth, Patterned</td>
<td>ASTM C1526 95/28/EC</td>
</tr>
<tr>
<td>Carpet</td>
<td>18 oz. Width: 80&quot; Wide</td>
<td>Non-woven Rough</td>
<td>FMVSS 302</td>
</tr>
</tbody>
</table>

### Safety Features

- Front and Rear Seat Belts
- Parking Radar Sensors
- Front Seat Belt Pretensioners
- Parking Brake Controlled Video Display
- Emergency Brake
- Side Mirrors
- Turn Signals
- Backup Camera
- Air Bags

### Technical Specifications

#### Comfort
- Air Conditioning
- Sun Visors
- Trunk Area Light
- Back Head Rests
- Front and Rear Floor Mats
- Power Seats

#### Entertainment
- In-dash Double DIN 6.2" Touch Panel Control
- DVD Video/CD/DA/MP3/WMA Playback Capability
- FM Receiver
- Auxiliary Audio Input
- GPS Tracking and On screen Navigation
- Remote Control
- Built-in Bluetooth
- USB Music and Video Playback
- Hands-Free Phone Operation via Bluetooth
- Music Playback from iPod/iPhone via USB
- Door-Housed Speakers
- Anti-Glare Video Display

#### Convenience
- Front Seat Back Storage
- Front Console with Storage
- Cup Holders
- Front Door Pockets
- Trunk Space
- Interior Dome Lights
- 2 Front and Rear Height Adjustable Headrests
- Electric Powered Steering System

#### Seats
- Height Adjustable Driver and Passenger Seat, Bucket front seats and Reclining Seats

#### Power Features
- Power Windows, Seats, Mirrors, Wiper System and Door Locks

#### Instrumentation
- Battery State of Charge, Fuel Gauge, Speedometer, Drive position, Motor temperature

#### Tires and Wheels
- 225/40ZR18 Tires, Chrome Plated Wheels, R18 X 6.5 Wheels and All Season Tires
The realisation of KIIRA EV SMAQ and the KIIRA EV Project is made possible by the support from the following individuals and Institutions:

1. HE YK Museveni the President of the Republic of Uganda for the patronage provided in cultivating the KIIRA EV Project Vision.


3. Fabrication and Systems Integration: CRIPPS under the leadership of Professor JK Byaruhanga and Eng. Peter Lyamungu, as well as Moses Wasswa Kabule and his Team; The Team at Specialized Welding Services, New Eagle, Ann Arbor, Michigan; and Jeffrey Berber at IE Drives, Denver Colorado.

4. Linkages with International Suppliers and Automotive Development Community in USA: Andrew Watchorn, the Flint & Genesee Chamber of Commerce for Linking The Kiira EV Project to the Michigan Automotive Industry; Professor Judson Harward at Harvard University & Professor Jesus De Alamos of Massachusetts Institute of Technology for the linkages with Harvard & MIT Scholarly Communities.

5. Nurturing the Project: Makerere University Community, CEDAT in particular, with the Guidance and Mentorship by Prof. Barnabas Nawangwe, Prof. Lillian Tibatemwa-Ekilikubinza, Mr. Amos Ngabirano, Dr. Joshua Mutamulira, Mr. Fred Ogene, Ms. Pauline Among, Mr. Francis Kiwa, Mr. David Wamuzi, Dr. Shinyabulo Mutende James and Dr. Florence Nakayiwa.

6. The KIIRA EV Project Team for the effort to keep the Kiira EV Project Vision alive.