Supporting Information.

Visible-light driven water splitting over BiFeO$_3$ photoanodes grown via the LPCVD reaction of [Bi(O'Bu)$_3$] and [Fe(O'Bu)$_3$]$_2$ and enhanced with a surface nickel oxygen evolution catalyst

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Scheme 1: Schematic diagram of the home-built dual-source LPCVD apparatus for deposition of BiFeO$_3$ films. Objects in red indicate those parts that are controllably heated. Arrows indicate the direction of gas flow.

Figure S1: Vapour pressure curves and TGA traces of [Fe(O\text{Bu})$_3$]$_2$ and [Bi(O\text{Bu})$_3$]$_2$. The heating rate was 10 °C min$^{-1}$. 
Figure S2: X-ray diffraction patterns of films deposited between 450 - 525 °C.

Figure S3: Film growth rates as a function of substrate temperature. The thicknesses were obtained via side-on SEM imaging.
Figure S4: X-ray diffraction patterns of the films deposited at 15 mbar, 30 mbar and 45 mbar.
Figure S5: XPS spectrum of the bismuth 4f region.

Figure S6: XPS spectrum of the oxygen 1s region.
Figure S7: Room temperature P-E hysteresis loop measured at 1 kHz for a 690 nm thick BiFeO$_3$ film deposited on Pt/SiO$_2$/Si substrate sputtered with Pt top electrodes.

Figure S8: Enlarged M-H hysteresis loop measured at 5 K for the 880 nm thick BiFeO$_3$ film grown \textit{via} LPCVD at 550 °C, 8 mbar, to display the coercivity.
Figure S9: M-H hysteresis loop measured at 300 K for the BiFeO$_3$ film grown via LPCVD at 550 °C, 8 mbar. The inset plot shows the M-H curve enlarged to display the coercive field of the sample.

Figure S10: XPS spectrum of the Nickel 2p region from a Ni-BiFeO$_3$ film. Asterisks (*) indicate Ni 2p satellite peaks.